

	L #	Hits	Search T xt	DBs
1	L1	4309	intellectual adj property	USPAT
2	L2	112	digital adj work	USPAT
3	L3	4410	1 or 2	USPAT
4	L4	22220	seller or (buyer or purchaser)	USPAT
5	L5	173	3 and 4	USPAT
6	L6	60	agreement and 5	USPAT
7	L7	11	6 and kiosk	USPAT
8	L8	47	4 and agreement and kiosk	USPAT
9	L9	39	8 and payment	USPAT
10	L10	456	4 and broker\$5	USPAT
11	L11	194	10 and agreement	USPAT
12	L12	167	11 and payment	USPAT
13	L13	9	12 and kiosk	USPAT
14	L14	11	12 and 1	USPAT
15	L15	274	10 and agree\$5	USPAT
16	L16	218	15 and payment	USPAT
17	L18	2	17 not 14	USPAT
18	L19	9	16 and kiosk	USPAT
19	L20	0	19 not 13	USPAT
20	L21	14830	intellectual adj property	US-PGPUB; DERWENT; IBM_TDB
21	L22	148	digital adj work	US-PGPUB; DERWENT; IBM_TDB
22	L23	14950	21 or 22	US-PGPUB; DERWENT; IBM_TDB
23	L24	3232	seller and (buyer or purchaser)	US-PGPUB; DERWENT; IBM_TDB
24	L25	163	23 and 24	US-PGPUB; DERWENT; IBM_TDB
25	L26	98	25 and agree\$6	US-PGPUB; DERWENT; IBM_TDB

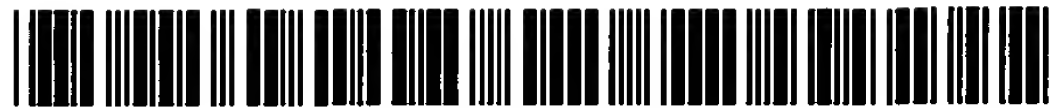
	L #	Hits	Search Text	DBs
26	L27	77	26 and payment	US-PGPUB; DERWENT; IBM_TDB
27	L28	15	27 and kiosk	US-PGPUB; DERWENT; IBM_TDB
28	L29	300	"77" and broker\$5	US-PGPUB; DERWENT; IBM_TDB
29	L30	300	"77" and broker\$5	US-PGPUB; DERWENT; IBM_TDB
30	L31	29	27 and broker\$5	US-PGPUB; DERWENT; IBM_TDB
31	L32	26	31 not 28	US-PGPUB; DERWENT; IBM_TDB
32	L33	4	broker\$5 and agree\$6	EPO; JPO
33	L34	70	trad\$3 and seller	EPO; JPO
34	L35	0	34 and kiosk	EPO; JPO
35	L36	10	34 and payment	EPO; JPO
36	L37	0	5 and trad\$4	EPO; JPO
37	L38	90	5 and trad\$4	USPAT
38	L39	19	38 and kiosk	USPAT
39	L17	13	16 and 3	USPAT

	L #	Hits	Search Text	DBs
1	L1	1089	select\$5 with agreement	USPAT
2	L2	1330	seller and (buyer or purchaser)	USPAT
3	L4	78	plurality near3 agreement	USPAT
4	L5	21	4 and trad\$3	USPAT
5	L3	32	1 and 2	USPAT
6	L6	1	("6343738").PN.	USPAT

Considered

	L #	Hits	Search Text	DBs	
	1	L1	1348	frequen\$4 near5 (purchas\$3 or shop\$4)	USPAT
	2	L2	4326	intellectual adj property	USPAT
	3	L3	1931	digital near3 (goods or works)	USPAT
	4	L4	6206	2 or 3	USPAT
Considered	5	L5	25	1 and 4	USPAT
	6	L6	1	popular with 4	USPAT
	7	L7	192	popular near4 (purchas\$4 or shop\$4)	USPAT
Considered	8	L8	6	7 and 1	USPAT
	9	L9	1837	popular near4 (item or product)	USPAT
Considered	10	L10	30	9 and 1	USPAT
	11	L11	241	habit near5 (purchas\$3 or shop\$4)	USPAT
	12	L12	76	1 and 11	USPAT
	13	L13	69	12 not 5 not 6 not 8 not 10	USPAT
Considered	14	L14	16	13 and kiosk	USPAT
	15	L15	1	("6240396").PN.	USPAT





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**Ogilvie**

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(54) **AUTOMATIC BROKER TOOLS AND TECHNIQUES**

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(51) **Int. Cl.<sup>7</sup>** ..... **G06F 7/08**

(52) **U.S. Cl.** ..... **235/381; 235/380; 705/26**

(58) **Field of Search** ..... 235/379, 381, 235/494, 480, 375, 382, 382.5, 454, 371; 705/26, 1, 27, 37, 75, 77, 80, 2, 7; 902/1, 8, 30, 41; 379/144, 112, 113

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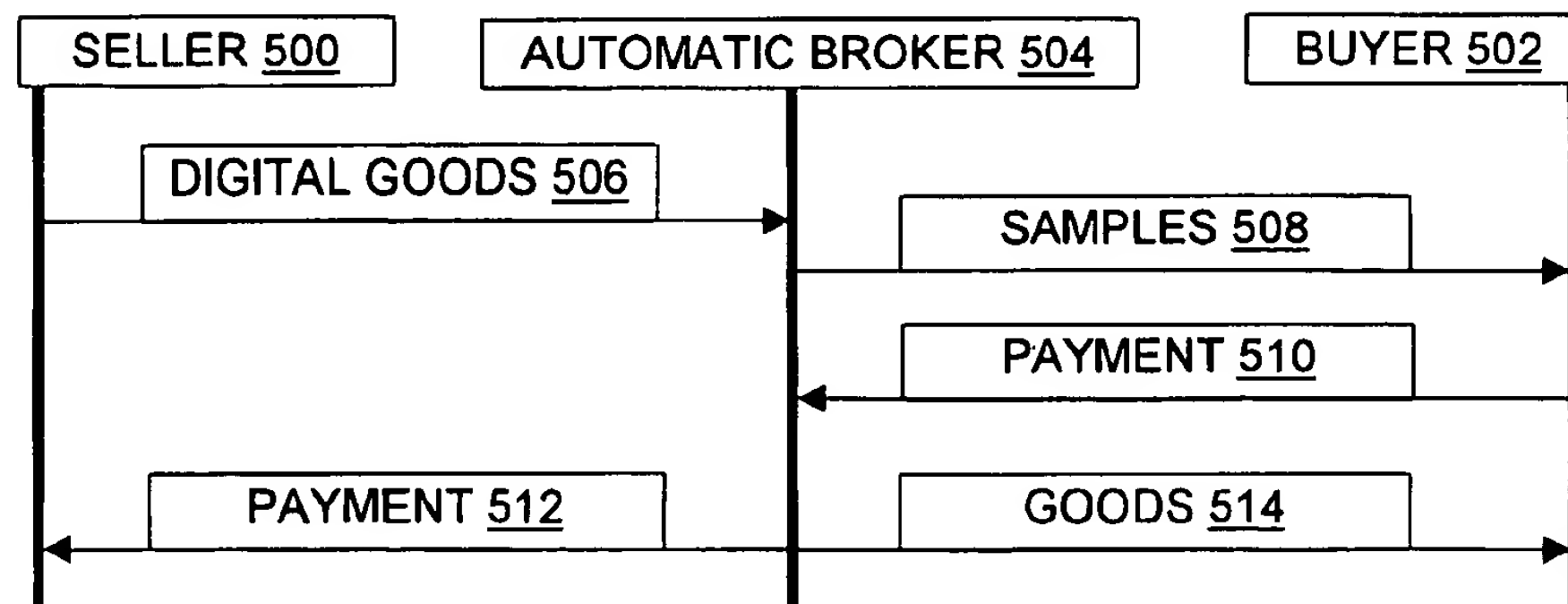
*Primary Examiner*—Thien M. Le

(74) *Attorney, Agent, or Firm*—Computer Law++

(57) **ABSTRACT**

The invention provides sampling, escrowing, and other tools and techniques for facilitating transactions that involve digital goods. Transactions may be of the goods-for-payment type, or they may be barter transactions that exchange goods for goods. Digital goods may be escrowed with an automatic broker. The broker may also create and distribute samples of the goods, which are created by techniques such as distorting or burdening part or all of a copy of the goods. In some cases the broker may accept and act on approval or disapproval notices from the parties to a transaction, to cancel or complete a transaction. In other cases, the broker's participation is limited to providing and/or authenticating samples.

**35 Claims, 6 Drawing Sheets**



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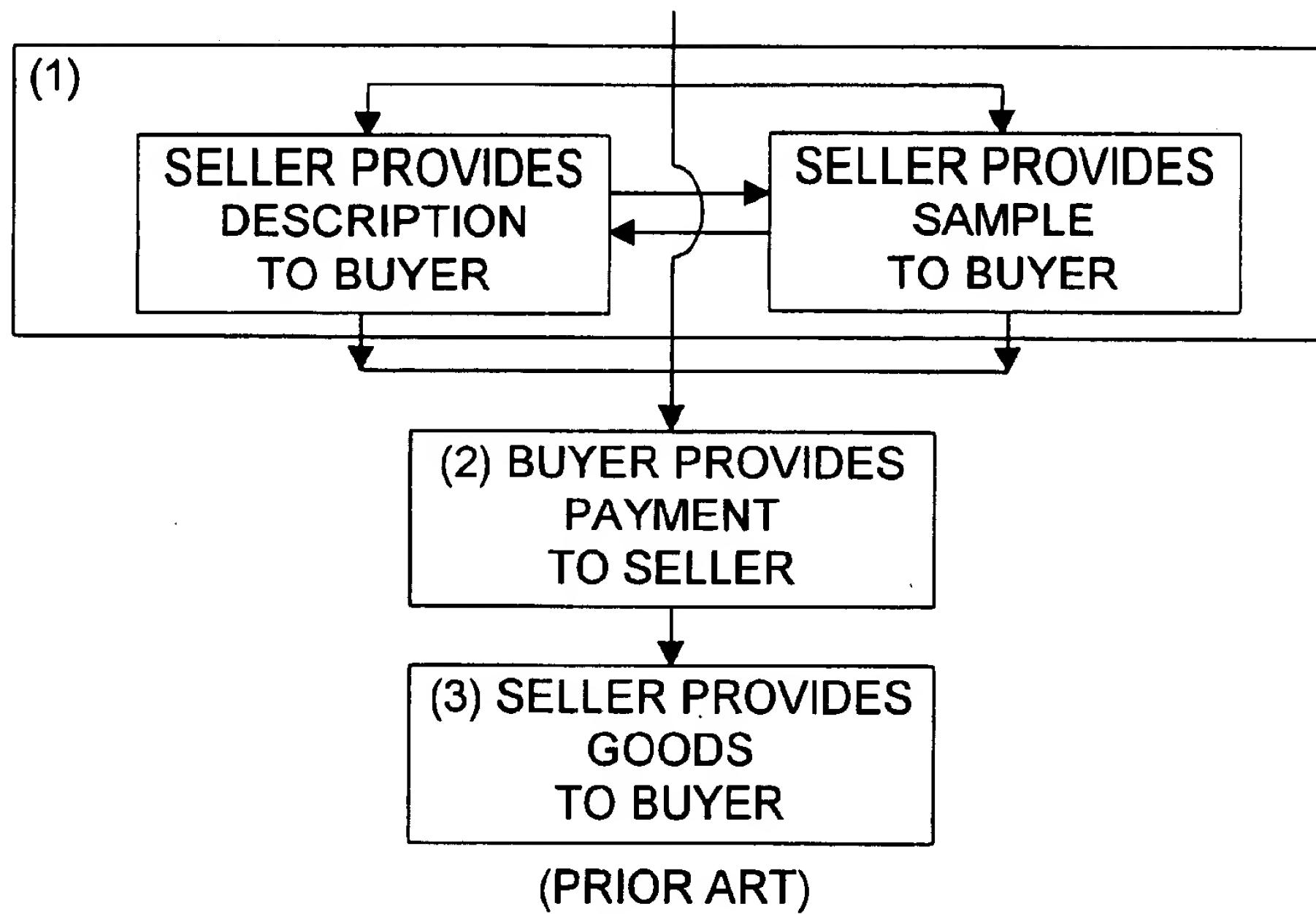
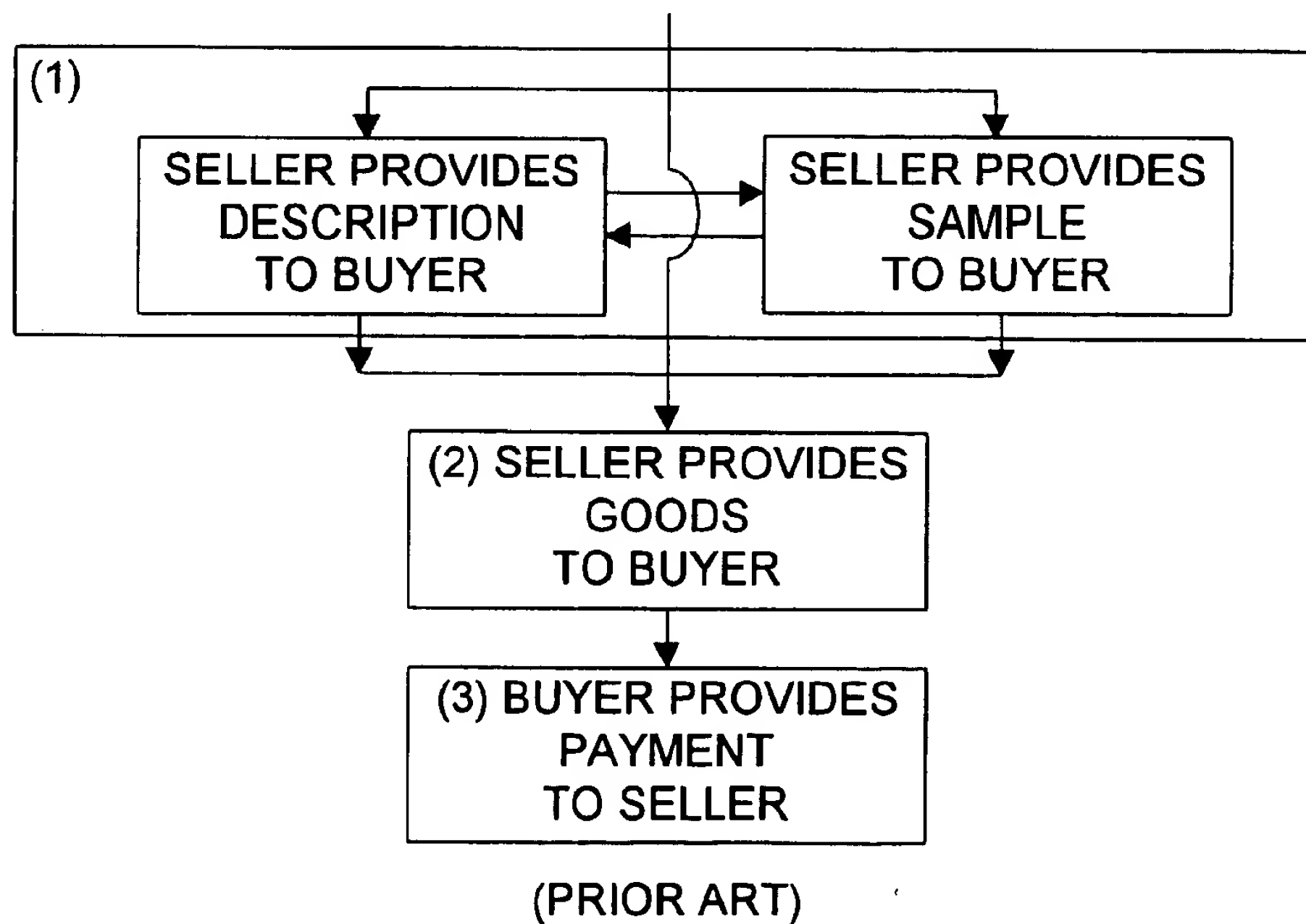
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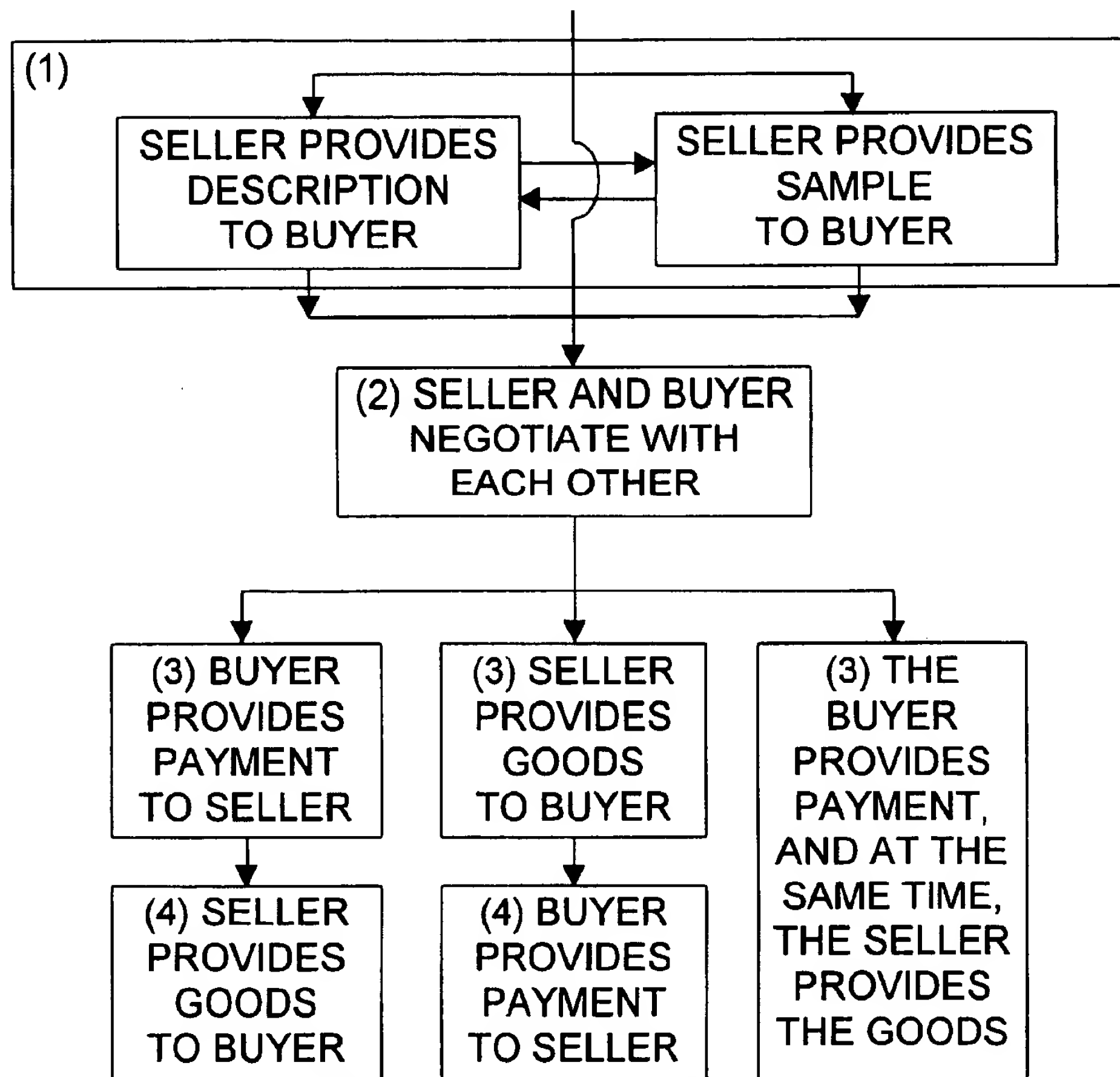
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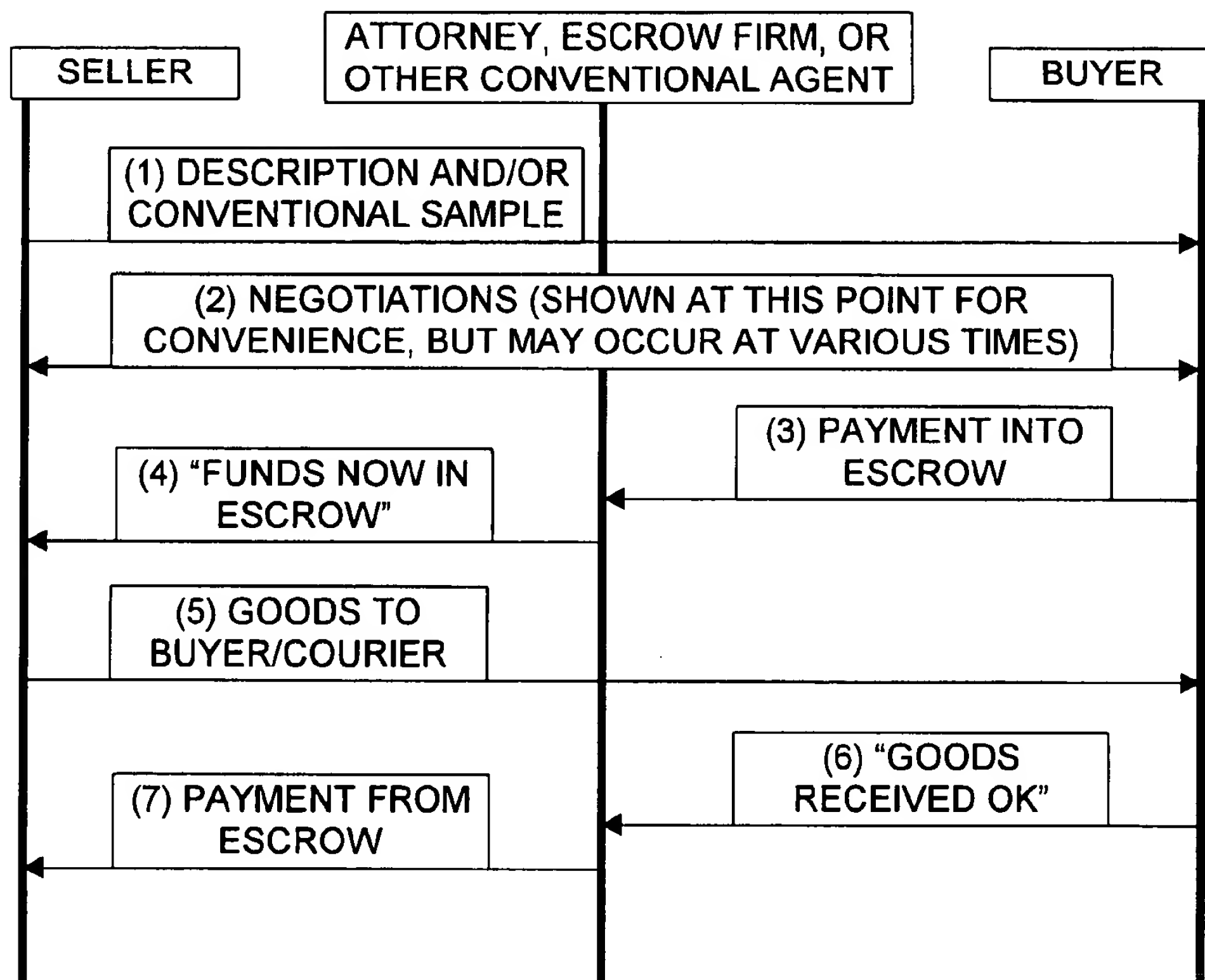
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*Fig. 1**Fig. 2*



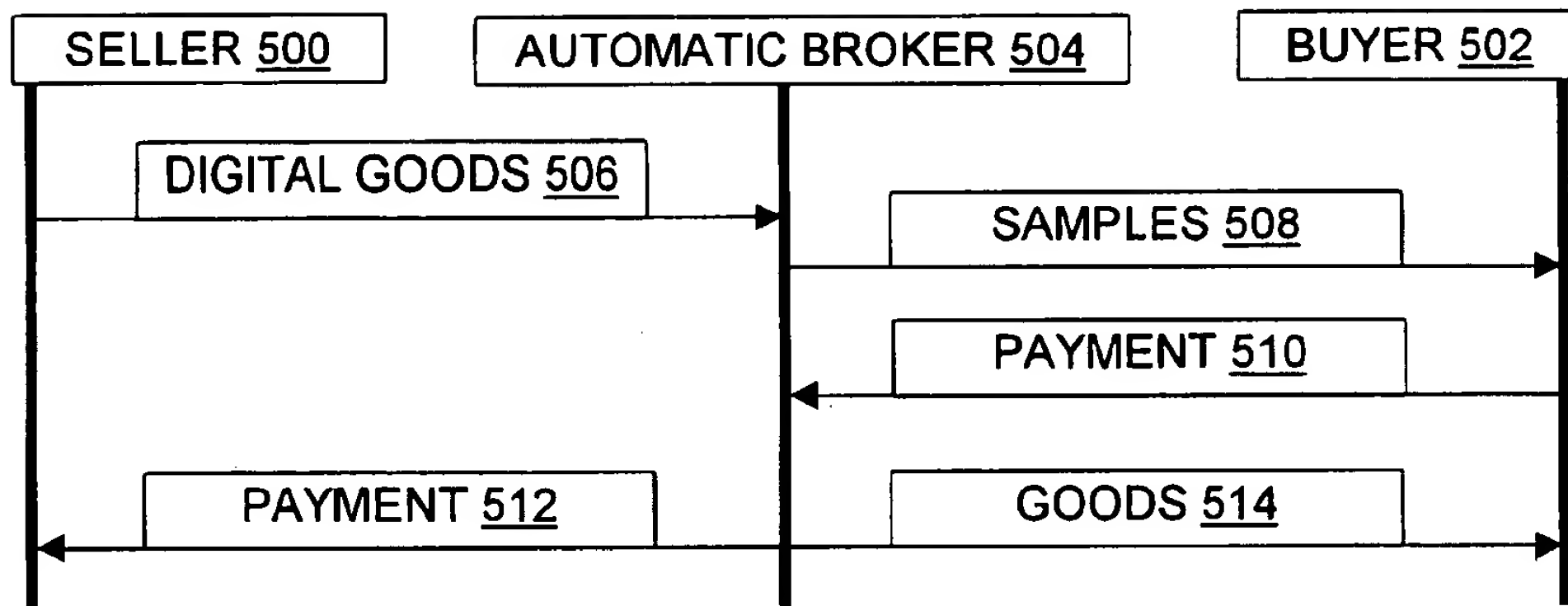
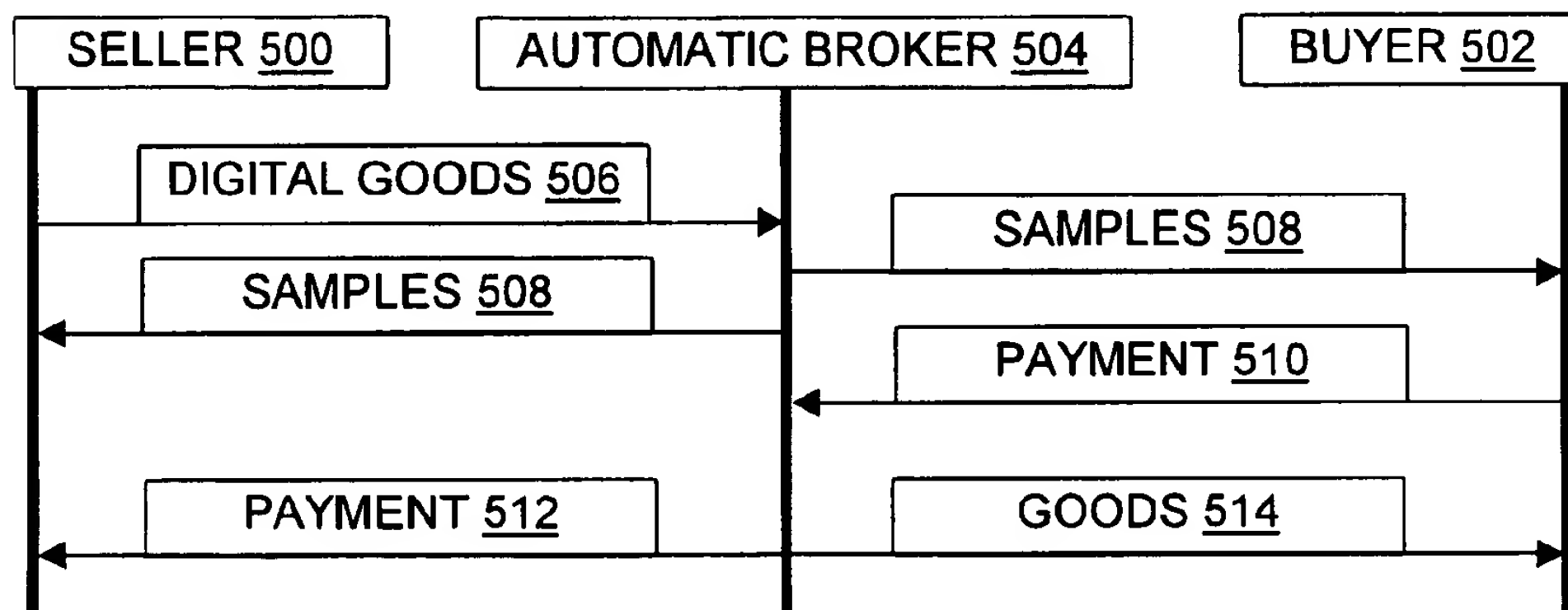
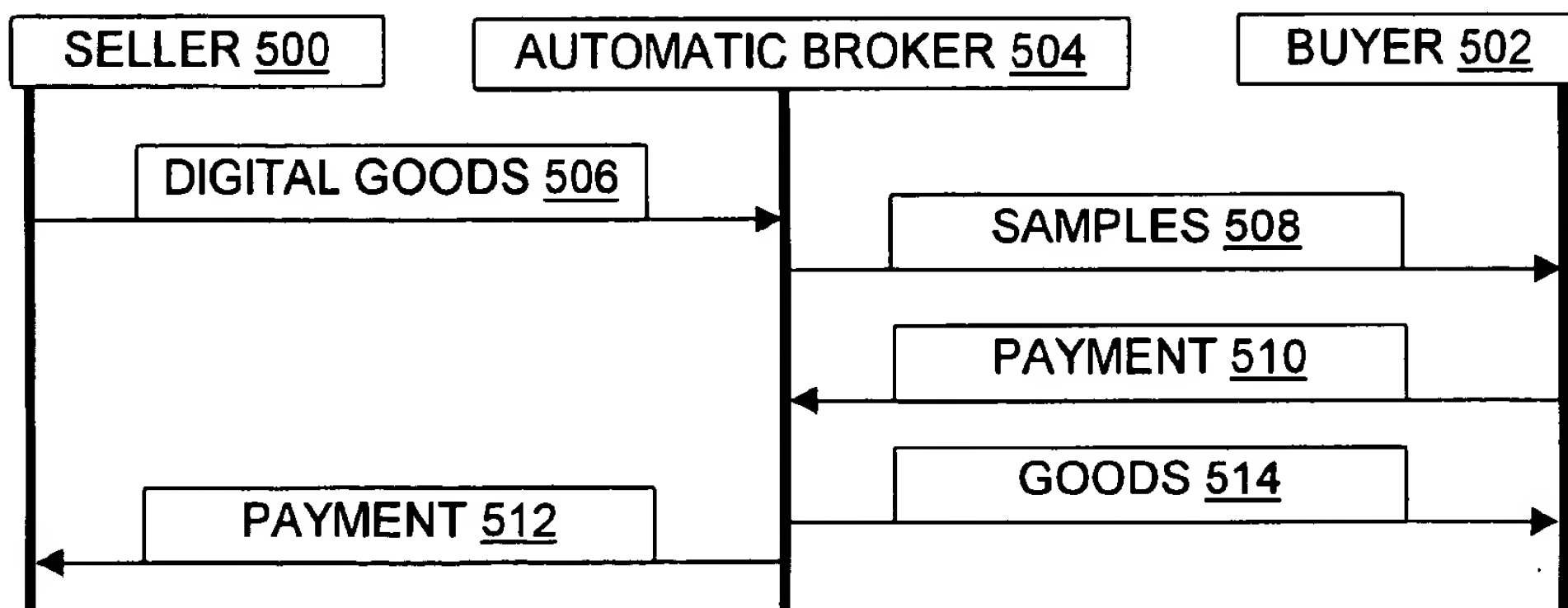
(PRIOR ART)

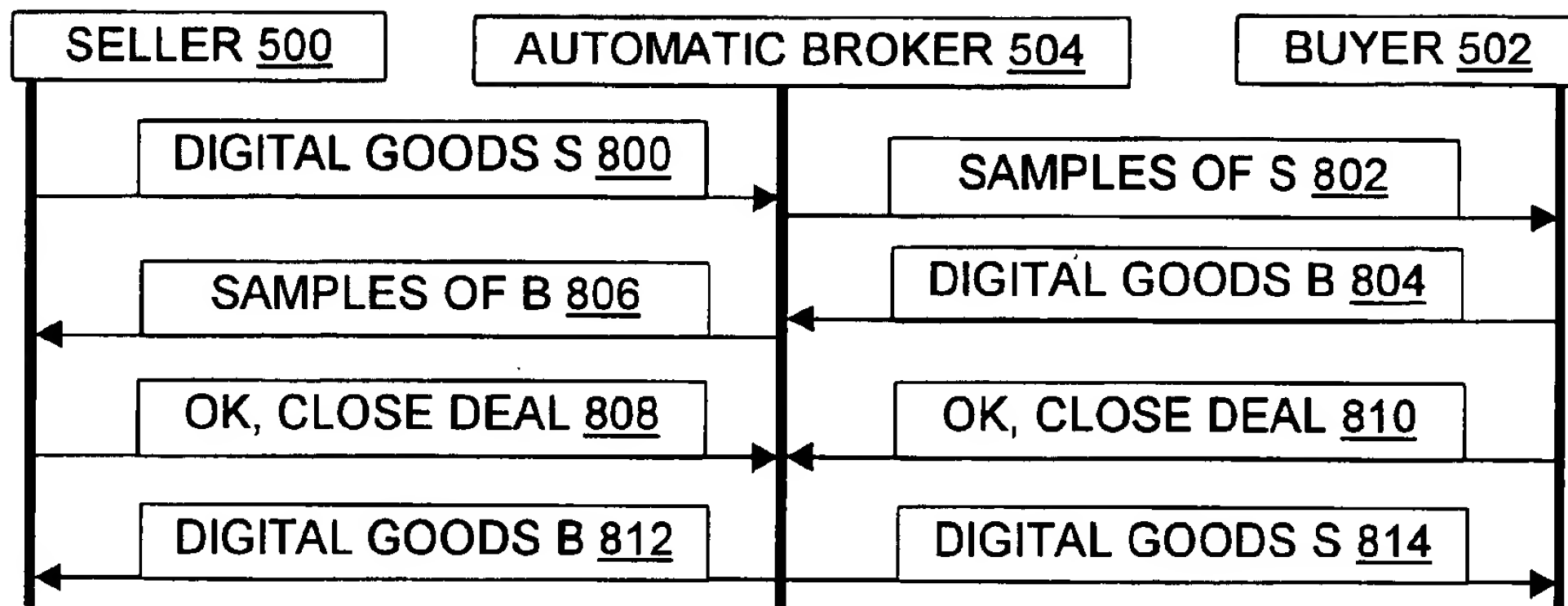
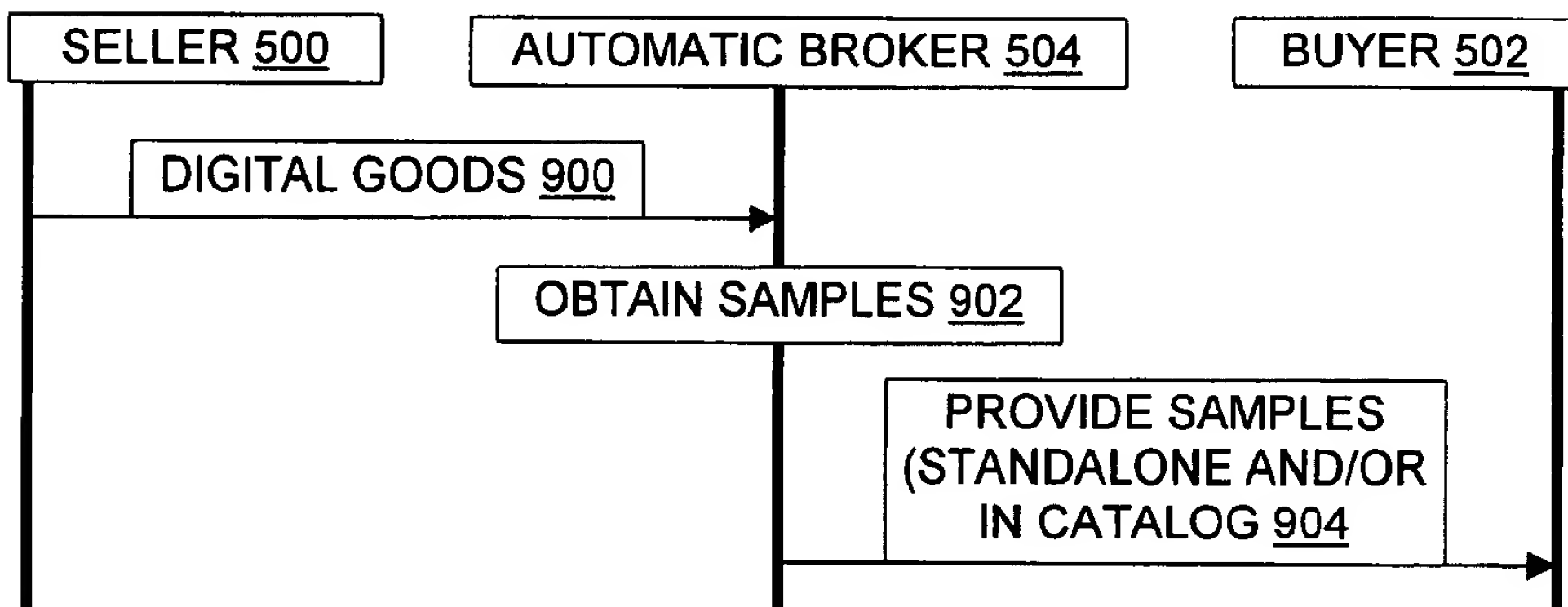
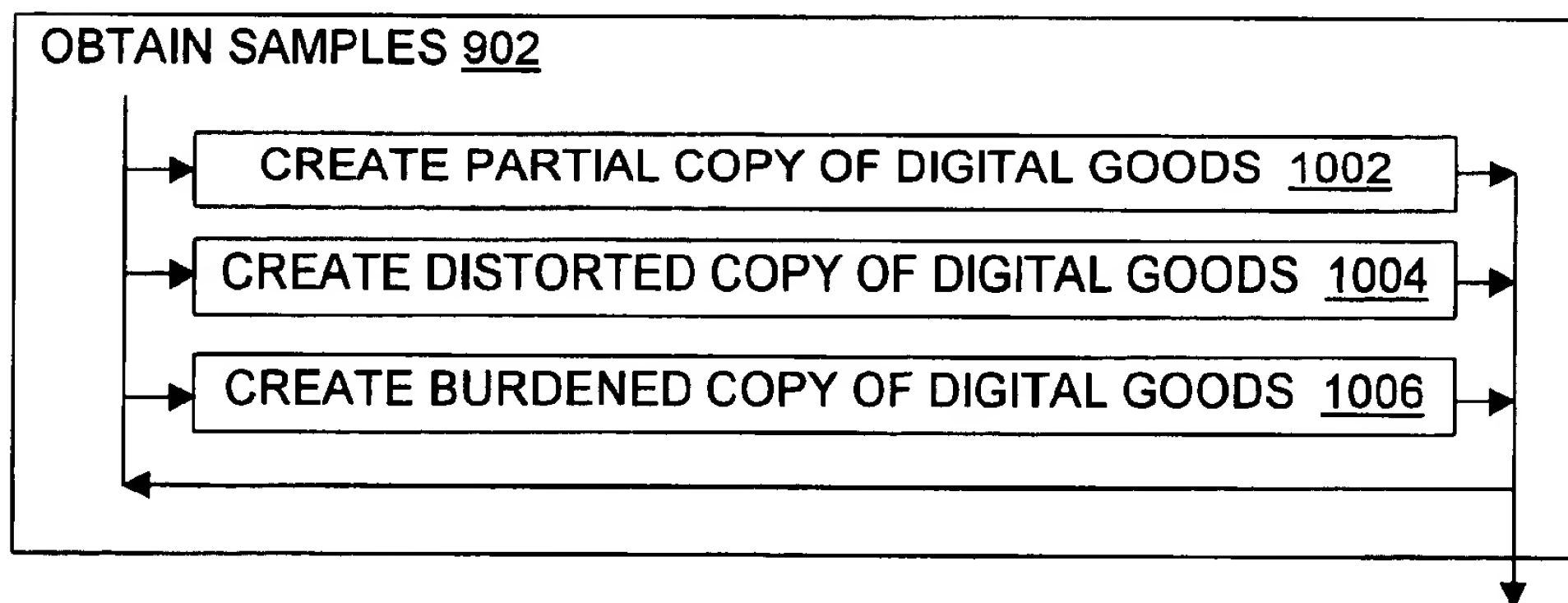
*Fig. 3*

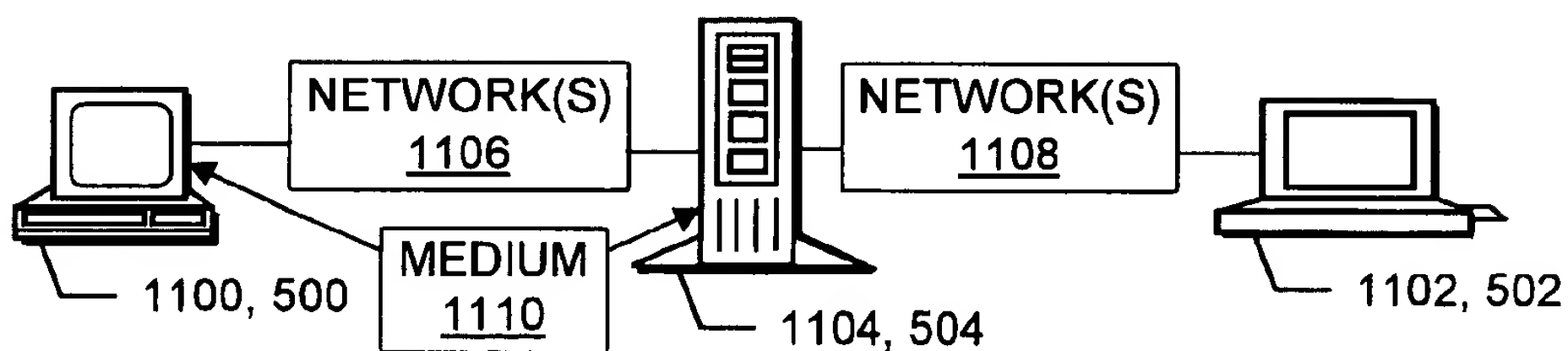
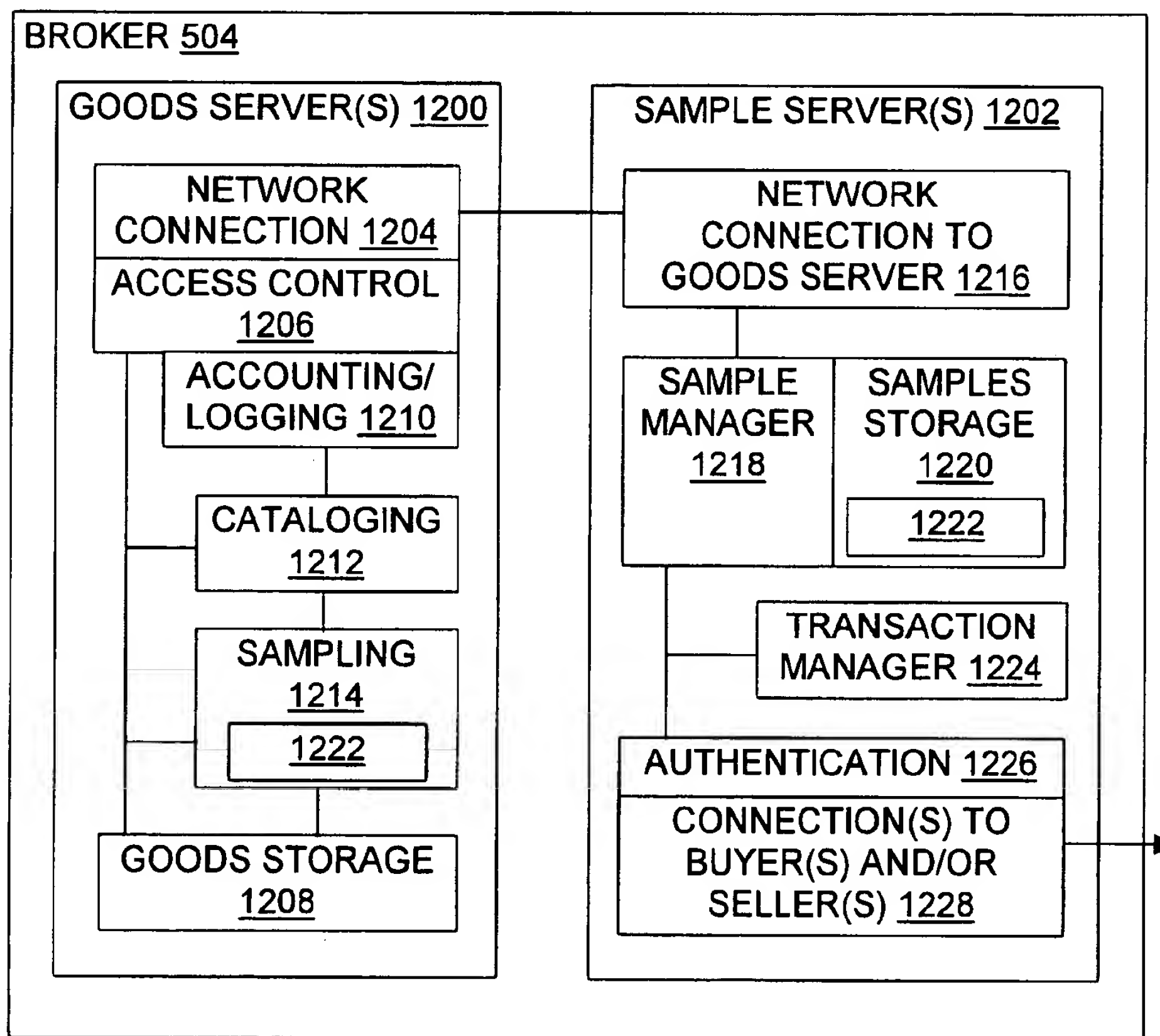


(PRIOR ART)

*Fig. 4*

*Fig. 5**Fig. 6**Fig. 7*

*Fig. 8**Fig. 9**Fig. 10*

*Fig. 11**Fig. 12*



## AUTOMATIC BROKER TOOLS AND TECHNIQUES

### RELATED APPLICATIONS

This application claims priority to, and incorporates by reference, commonly owned copending U.S. Patent Application No. 60/134,383 filed May 15, 1999.

### FIELD OF THE INVENTION

The present invention relates to the technical goal of providing prospective buyers and sellers of digital content with information and assurances, and relates more particularly to sampling, escrow, and barter tools and techniques for an automated broker to facilitate a market in digital content.

### TECHNICAL BACKGROUND OF THE INVENTION

Advances in computer technology have created an enormous body of digital content, namely, content stored as bits in some computer-readable medium. Some categories of digital content have widely used non-digital counterparts. For instance, books are still more widely available in paper form than in digital form. Other categories of digital content exist primarily or solely in response to the widespread use of digital computers; examples include databases and software. Some categories of digital content exist primarily to entertain. Others reflect research, development, or marketing efforts. Regardless of such distinctions, one result of the computer revolution is a growing body of valuable artistic, technical, business, academic, and other content stored in various digital formats.

Another result of the computer revolution is relatively easy communication of digital content. The Internet (including the World Wide Web), email, "instant messaging" services, "chat rooms", news groups, electronic discussion forums and bulletin boards, and other computer-aided avenues of communication are now available in many parts of the world. One might expect these communication tools to support a thriving market in the growing body of digital content. Indeed, much digital content is advertised, purchased, and/or delivered through the Internet and other computer-assisted communication tools.

For example, demonstration versions of computer software can be downloaded by prospective users without any direct human action, once the software owner selects the software version and places a copy of the selected software on a web site, FTP site, or other electronically accessible location. Full-function versions can also be paid for and then obtained through commercial transactions that require little or no direct human action, other than having the seller initially provide a master copy of the software and having each buyer provide payment information such as a credit card number. Shareware software can similarly be downloaded using computer programs as intermediaries, rather than relying on a human sales clerk. In short, online software shops are well-known.

Moreover, transactions involving goods other than software can also be performed using software sales "personnel". Auction sites such as www.ebay.com facilitate transactions involving software and many other types of goods, both digital and non-digital. Reverse auction or "demand collection" sites such as www.priceline.com facilitate transactions involving both goods and services.

These and/or other "e-commerce" sites offer prospective buyers and competing sellers information about goods and

services of virtually every type, and many sites also allow one to purchase goods and/or services on-line. To give just a few examples, web sites exist to advertise and/or sell patent rights, games, software, books, mortgage services, oil and gas properties, medical supplies, scientific equipment, factory simulation services, insurance services, computers, management consulting services, investment banking services, and "adult" content and services. Sellers' sites generally provide textual descriptions of the goods and/or services being offered, and many offerings also include images and/or sounds that represent or constitute the offered goods and/or services. The images may be still images, video clips such as those in MPEG or AVI format, or user-navigable images such as those in the IPIX format.

The images sometimes include samples in the form of partial images or thumbnail images. These samples are apparently selected by the seller and/or approved by the seller for posting based on the seller's understanding of the techniques used to create the samples. That is, the seller apparently knows what prospective buyers will see when they view the samples. If the goods are digital images, these samples may be presented with the promise that complete and/or larger images are available to be downloaded in exchange for payment. Similarly, video and/or audio clips showing part of a work may be presented to encourage purchase of a copy of the complete work.

Despite the enormous amount of activity in electronic commerce, problems remain. One factor that makes the market in digital content risky is the ease with which most digital content can be copied. Of course, many efforts have been made to reduce unauthorized use of digital content. For instance, copyright laws, other intellectual property laws, encryption that prevents use of a product without user registration and/or payment, other technical measures, and the basic honesty of many people, can each provide some protection against the theft of digital content.

But a content owner may still be justifiably reluctant to make that content available for inspection by prospective buyers, lest the content be copied and used without paying the owner. On the other hand, buyers may quite reasonably want to inspect the digital content before they pay for it. Unless the buyer and the seller have a working relationship based on successful completion of earlier transactions, or trust each other for some other reason, the lack of trust can prevent successful completion of the transaction even when such completion would benefit both parties.

To help illustrate the issues of trust involved in a transaction between a seller and a buyer, we define some notation. This notation, or similar notation, may have been used previously but the notation itself is not the invention. Rather, the notation is used in this Technical Background to describe prior approaches to marketplaces in digital content, and it is also used in later sections to describe the present invention, just as English (or another language) can be used for both purposes. That is, the fact that the notation is used in discussing both past approaches and the present invention does not mean that the invention described with that notation was previously known.

Naming the initial participants and items involved is straightforward: we use "S" to denote a seller, "B" for a buyer, "G" for the goods or services being sold, and "\$" for payment (understanding that other currencies than U.S. dollars may also be used).

If all goes well a seller S transfers goods G to a buyer B and receives payment \$ as compensation. But the order of events in the transaction can be very important, so the

notation also describes different orders. When S hands B the goods and then receives the payment, in that order, the steps in this transaction may be represented as:

S-G->B; S<-B.

Diagrams or other notation could also be used; the notation above has the advantage of not requiring special characters or any drawing (graphics) facility. If the seller first receives payment and only then turns over the goods to B, the transaction may be represented as:

S<-B; S-G->B

or as:

S<-B

S-G->B

If we do not know or do not care about the order (either act may occur first, or they may partially or completely overlap each other), then the transaction is shown as:

(S-G->B || S<-B)

or, equivalently, as:

(S<-B || S-G->B)

Finally, if the two acts must overlap in time, we write:

(S-G->B && S<-B)

or, equivalently:

(S<-B && S-G->B).

A single "|" means "or" in the sense of one act or another act or both acts being done. A single "&" means "and" in the sense of both acts being done.

S and B will often negotiate before exchanging goods and payment, with one or more offers, counteroffers, conditions, and/or acceptances before goods and payment are exchanged. Such negotiations are written as:

S<-N->B

The "N" stands for "negotiation(s)" and the arrow is bidirectional to indicate the back-and-forth nature of most negotiations.

The seller S will often provide (and/or the buyer B will require) a description and/or a sample of the goods. These events can be represented (and annotated with comments) like this:

S-DM->B //description and sample

S-D->B //description only

S-M->B //sample only

The sample M is a conventional sample, that is, it is obtained using tools and techniques which are known in the art and it is provided in the context of conventional commercial transactions. As explained later, the present invention provides novel samples, samples which are obtained by novel tools and/or techniques, and/or samples which are used in the novel context provided by the invention.

If a step is optional, we precede it by "?". For instance, if the seller's provision of a sample can be either present or omitted without substantially altering the trust (or other) issues being discussed, but negotiation is essential, we could write:

(S<-N->B || ?(S-M->B)); (S-G->B || S<-B)

The notation could be made even more complex, borrowing ideas from areas like computer programming, logical calculus, and multiprocessing, but the notation is not the goal. Understanding and improving transactions is the goal. We will use the notation and/or Figures hereafter.

Consider some trust issues, which may depend on the order of events in a transaction. For instance, consider transaction T1, which is illustrated in FIG. 1 and described by the notation as follows:

1. ?(S-D->B) || ?(S-M->B)

2. S<-B

3. S-G->B

If the description and/or sample provided in step (1) are faulty, then the payment in step (2) may be too high. For instance, the quality of the goods may be lower than the sample led the buyer to expect. Even if any description and/or sample provided in step (1) are accurate, seller S may "take the money and run", so the desired step (3) doesn't occur as buyer B expected. Buyer B is forced to trust that descriptions and/or samples provided by seller S accurately represent the goods G, and buyer B is also forced to trust that seller S will not disappear after being paid, leaving buyer B without the goods G for which B paid.

An alternative is transaction T2, which is illustrated in FIG. 2 and described by the notation as follows:

1. ?(S-D->B) || ?(S-M->B)

2. S-G->B

3. S<-B

This approach forces seller S to trust that buyer B will not simply take the goods and fail to make payment in the desired step (3).

Another alternative is transaction T3:

1. ?(S-D->B) || ?(S-M->B)

2. S-G->B && S<-B

That is, the seller and the buyer each hand the other the goods and the payment, respectively, at essentially the same time. This may be good in theory, but it is difficult in practice. Each must trust the other not to outwit or overpower them and then leave with both the goods and the payment, leaving one party empty-handed. To succeed reliably, T3 requires matching levels of trust and power, which are relatively rare when one looks at the wide range of parties that could mutually benefit from completing a transaction with each other.

Each of these transactions can be improved somewhat by having each party learn more about the other through negotiations, using transactional approaches such as those which are illustrated in FIG. 3 and summarized in the following notation:

Transaction T1N:

1. ?(S-D->B) || ?(S-M->B)

2. S<-N->B

3. S<-B

4. S-G->B

Transaction T2N:

1. ?(S-D->B) || ?(S-M->B)

2. S<-N->B

3. S-G->B

4. S<-B

Transaction T3N:

1. ?(S-D->B) || ?(S-M->B)

2. S<-N->B

3. S-G->B && S<-B

But trust issues remain. In T1N, B might not receive accurate samples and descriptions, and B might not receive the goods or services after paying for them. In T2N, S might not receive payment after providing the goods or services. In T3N, each party may be at risk of being outwitted or overpowered by the other.

Another set of alternatives use a conventional agent A such as a broker, attorney, banker, or other "trusted third party" who is trusted by virtue of being neutral, bonded, licensed, and/or regulated, for example. The agent A is a human, or an institution directly operated and controlled by humans. One transaction T4 involving seller S, buyer B,

## 5

agent A, goods or services G, payment \$, and approvals OK is illustrated generally in FIG. 4. Time advances as one moves from the top of the Figure toward the bottom. In the notation we have been using, the transaction T4 goes something like this:

1. ?(S-D->B) || ?(S-M->B)
2. ?(S<-N->B) // could also precede step (n), or precede and follow, or overlap
3. A<-\$-B // agent A receives money from buyer; A "holds" or "escrows" the \$
4. S<-OK-A // A confirms to S that A has the payment
5. S-G->B
6. S<-OK-B || A<-OK-B // B OK's the goods and OK's payment completion
7. S<-\$-A // A releases the funds to S

However, agent A must be trusted by both seller S and buyer B. A must be trusted by B, lest A leaves with the payment after step (3). B must also trust A to perform step (7) when, and only when, approval is given to A by B in step (6). A must be trusted by S, lest A leaves with the payment after step (3), or receives the payment but denies receiving it (no step (4)). There are other ways for the transaction to go wrong if trust is undeserved (such as partial payments or damaged goods or faulty timing), but these suffice for now.

Another transaction T5 involving an agent goes like this:

1. ?(S-D->B) || ?(S-M->B)
2. ?(S<-N->B) // could also precede (n), or precede and follow, or overlap
3. (A<-\$-B || S-G->A) // agent receives money from buyer and goods from seller
4. (A-OK->B || S<-OK-A) // agent confirms goods & payment OK and in hand
5. (A-G->B || S<-\$-A) // agent releases goods to buyer & payment to seller

Again, agent A must be trustworthy and trusted. Otherwise, for instance, A could improperly retain possession of both the goods and the money after step (3). A could also intentionally misrepresent the amount, quality, or receipt of the goods, and/or the amount, quality, or receipt of the payment in step (4). A could also release an item (goods or payment) to one party but not release the other item in step (5) if A improperly favors one party unbeknownst (at least beforehand) to the other.

In short, conventional approaches to commercial transactions pose significant risks to buyers and sellers. These risks are increased by the ease with which digital goods can be copied once they are made available for inspection. The need for trust is also increased by the fact that the Internet and other communications media make it more likely than ever that a prospective buyer and prospective seller do not have a history of successfully concluded transactions (at least not with each other), and that they may well be separated by long geographic distances, by different natural languages, by different national laws, and/or by cultural differences.

Accordingly, it would be an advance to provide tools and techniques which make it easier for prospective buyers to inspect digital goods without thereby creating a significant risk that those goods will be copied, and hence stolen, by someone who is merely posing as a buyer.

More generally, it would also be an advance to improve the market for digital content by providing tools and techniques which reduce and/or meet the need for the parties in a transaction to trust each other.

Such tools and techniques are disclosed and claimed herein.

## 6

## BRIEF SUMMARY OF THE INVENTION

The present invention relates to methods, articles, signals, and systems for facilitating electronic commerce in digital goods. Examples of digital goods include musical works, visual works, and other artistic works in digital form; patent applications, engineering documents, CAD files, and other technical information in digital form; software; mailing lists, customer databases, and other marketing information in digital form; intellectual property rights in patents, copyrights, trademarks, trade secrets, and/or technical or marketing know-how; and other information in digital form that does or may possess commercial value. The invention facilitates commerce in such goods by reducing or eliminating barriers by providing an improved basis for the parties to expect successful completion of the desired transaction.

In a transaction according to one embodiment of the invention, each of the two or more parties to a transaction provides an inventive automatic broker with (a) the ability to deliver some item of value to one or more of the other parties, such as goods or payment, and (b) conditional authorization to deliver that item. Each party then reviews information from the other party or parties (often sent by way of the broker) and approves or cancels completion of the transaction. If the parties approve completion, then the broker effects the transfers. Otherwise, the broker returns the digital items of value, releases its hold on them, and/or deletes them, such that the broker no longer has the ability to deliver the items.

Unlike some conventional approaches to transactions, all brokering functions can be provided automatically. This reduces cost, increases transaction throughput, and reduces the opportunity for transactions to fail due to mistakes or bad acts by a broker.

In particular, digital goods can be escrowed with an automatic broker by providing the broker with a copy to be stored on a medium accessible only to the broker (or at least not reasonably accessible to the party that provided the goods to be escrowed). Goods could also be escrowed on a medium that is accessible to the party that provided the goods, by encrypting them and/or digitally signing them so any changes made after they are provided to the broker can be prevented or can at least be detected by the broker and/or the buyer. However, placing copies at a location not known to the seller and/or not accessible to the seller is preferred, since preventing the seller from retrieving all copies of the escrowed goods will significantly reduce the risk that the seller will prevent a buyer from receiving the goods after paying (or bartering) for them.

Payments, such as credit card holds, bank transfers, digital cash, and the like, can also be escrowed by the broker. In transactions that exchange goods for goods (i.e., barter transactions) rather than exchanging goods for payment, all of the digital goods can be held in escrow by the broker pending authorization from the parties to complete the transaction, after which the goods are released by providing copies to the parties, as previously specified by the parties. Note that "payment" is used herein to mean cash, currency, or similar liquid payment, as opposed to goods or services.

The automatic broker can generate samples of digital goods, to be provided by the broker to a prospective buyer. Samples can also be provided to the seller, but this is not always necessary or appropriate. In some embodiments, the seller does not know what technique will be used to generate the sample, so the seller is discouraged from providing goods that will pass inspection only if a particular sampling



technique is used. The sampling techniques preferably permit the buyer to inspect the goods without thereby making the goods available for use by the buyer without purchase. Samples can also be provided in a catalog, to be browsed by specified or unspecified parties. For instance, a catalog might be open to general access within a company, or open to the public at large. Other aspects and advantages of the present invention will become more fully apparent through the following description.

#### BRIEF DESCRIPTION OF THE DRAWINGS

To illustrate the manner in which the advantages and features of the invention are obtained, a more particular description of the invention will be given with reference to the attached drawings. These drawings only illustrate selected aspects of the invention and thus do not limit the invention's scope. In the drawings:

FIG. 1 is a flowchart illustrating a prior art approach to transactions involving digital and/or non-digital goods, in which the buyer provides payment and the seller then provides the goods in response.

FIG. 2 is a flowchart illustrating a prior art approach to transactions involving digital and/or non-digital goods, in which the seller provides the goods and the buyer then provides the payment in response.

FIG. 3 is a flowchart illustrating prior art approaches to transactions involving digital and/or non-digital goods, including negotiations between seller and buyer, and showing alternatives in which the seller provides the goods and the buyer provides the payment in various orders.

FIG. 4 is a data flow diagram illustrating a prior art approach to transactions involving digital and/or non-digital goods, in which a conventional agent acts as an intermediary between the seller and the buyer.

FIG. 5 is a data flow diagram illustrating embodiments of the present invention with transactions involving at least some digital content, in which a novel automatic broker acts as an intermediary between the seller and the buyer, the broker receives the digital content from the seller, the broker provides samples based on that digital content to the buyer, and the broker completes the transaction by releasing payment to the seller and releasing the digital content to the buyer.

FIG. 6 is a data flow diagram illustrating embodiments of the present invention with transactions similar to those illustrated in FIG. 5, in which the novel broker also provides the seller with at least one sample which is being provided to the buyer to permit evaluation of the seller's digital content.

FIG. 7 is a data flow diagram illustrating embodiments of the present invention with transactions similar to those illustrated in FIG. 5, in which the novel broker completes the transaction by releasing payment to the seller and releasing the digital content to the buyer at different times, despite the risk that the later release will be prevented after the first release is underway or completed.

FIG. 8 is a data flow diagram illustrating embodiments of the present invention with transactions in which the seller and the buyer each provide digital content to be released to the other after their approval is given to the novel broker.

FIG. 9 is a data flow diagram illustrating embodiments of the present invention with transactions in which the novel broker is used primarily or solely to provide samples of digital content, and hence does not necessarily participate in the transaction by releasing payment or by releasing goods.

FIG. 10 is a flowchart further illustrating techniques which may be used in the novel broker, separately or in combination, to provide buyers and/or sellers with samples of digital content.

FIG. 11 is a diagram illustrating a configuration of computers and networks suitable for use according to the present invention.

FIG. 12 is a diagram illustrating an architecture for an automatic broker according to the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In describing methods, devices, signals, programs, products, and systems according to the invention, the meaning of several important terms is clarified, so the claims must be read with careful attention to these clarifications. Specific examples are given to illustrate aspects of the invention, but those of skill in the relevant art(s) will understand that other examples may also fall within the meaning of the terms used, and hence within the scope of one or more claims. Important terms may be defined, either explicitly or implicitly, here in the Detailed Description and/or elsewhere in the application file.

In particular, an "embodiment" of the invention may be a system, an article of manufacture, a method, the product of a process, and/or a signal which configures a computer random access memory, disk, CD, DVD, or other computer-readable media 1110. In jurisdictions which permit it, such as some European jurisdictions, an embodiment may also be a computer program, provided it meets the novelty, inventiveness/nonobviousness, and other legal requirements of the jurisdiction.

For convenience, reference is also made to sellers and buyers as "human parties" or "humans" to distinguish them from the automatic broker of the invention. But a buyer and/or seller may be any legal person, such as an individual, corporation, limited liability company, foundation, partnership, French "S.A.", German "GmbH", etc. Also, the broker is presumably programmed, built, or otherwise created and/or maintained by people according to teachings herein. Operation of the broker may be overseen by human administrators and driven by data and/or commands from human users. The broker may also be property of an individual, corporation, or other legal person.

#### Networks, Computers, Software, Infrastructure

Suitable networks for configuration and/or use as described here include one or more local area networks, wide area networks, metropolitan area networks, and/or "Internet" or IP networks such as the World Wide Web, a private Internet, a secure Internet, a value-added network, a virtual private network, an extranet, an intranet, or even standalone machines which communicate with other machines by physical transport of media (a so-called "sneakernet"). In particular, a suitable network may be formed from parts or entireties of two or more other networks, including networks using disparate hardware and network communication technologies.

One suitable network includes a server and several clients; other suitable networks may contain other combinations of servers, clients, and/or peer-to-peer nodes, and a given computer may function both as a client and as a server. Each network includes at least two computers such as the server and/or clients. A computer may be a workstation, laptop computer, disconnectable mobile computer, server, mainframe, cluster, so-called "network computer" or "thin client", personal digital assistant or other hand-held com-

puting device, "smart" consumer electronics device or appliance, or a combination thereof.

Each computer includes at least a processor and a memory; computers may also include various input devices and/or output devices. The processor may include a general purpose device such as a 80x86, Pentium (mark of Intel), 680x0, or other "off-the-shelf" microprocessor. The processor may include a special purpose processing device such as an ASIC, PAL, PLA, PLD, Field Programmable Gate Array, or other customized or programmable device. The memory may include static RAM, dynamic RAM, flash memory, ROM, CD-ROM, disk, tape, magnetic, optical, or other computer storage medium. The input device(s) may include a keyboard, mouse, touch screen, light pen, tablet, microphone, sensor, or other hardware with accompanying firmware and/or software. The output device(s) may include a monitor or other display, printer, speech or text synthesizer, switch, signal line, or other hardware with accompanying firmware and/or software.

The network may include communications or networking software such as the software available from Novell, Microsoft, Artisoft, and other vendors, and may operate using TCP/IP, SPX, IPX, and other protocols over twisted pair, coaxial, or optical fiber cables, telephone lines, satellites, microwave relays, modulated AC power lines, physical media transfer, and/or other data transmission "wires" known to those of skill in the art. The network may encompass smaller networks and/or be connectable to other networks through a gateway or similar mechanism.

At least one of the computers is capable of using a floppy drive, tape drive, optical drive, magneto-optical drive, or other means to read a storage medium. A suitable storage medium includes a magnetic, optical, or other computer-readable storage device having a specific physical configuration. Suitable storage devices include floppy disks, hard disks, tape, CD-ROMs, DVDs, PROMs, random access memory, flash memory, and other computer system storage devices. The physical configuration represents data and instructions which cause the computer system to operate in a specific and predefined manner as described herein. Thus, the medium 1110 tangibly embodies a program, functions, and/or instructions that are executable by computer(s) 1100, 1102, and/or 1104 to provide samples, escrow goods for bartering or for cash purchases, complete transactions, and/or otherwise help facilitate transactions in digital and/or other goods or services substantially as described herein. Likewise, the "wires" and other data carriers and hard drives and memory may embody signals for facilitating transactions in digital and/or other goods or services substantially as described herein.

Suitable software to assist in implementing the invention is readily provided by those of skill in the pertinent art(s) using the teachings presented here and programming languages and tools such as Java, Pascal, C++, C, database languages, APIs, SDKs, assembly, firmware, microcode, and/or other languages and tools. Suitable signal formats may be embodied in analog or digital form, with or without error detection and/or correction bits, packet headers, network addresses in a specific format, and/or other supporting data readily provided by those of skill in the pertinent art(s).

Much of the infrastructure that can be used according to the present invention is already available, such as: general purpose computers; computer programming tools and techniques; computer networks and networking technologies; digital storage media; authentication, access control, and other security tools and techniques provided by public keys, encryption, firewalls, and/or other means; bank transfers,

credit card processing, digital money, and other tools and techniques for making payments. Such existing technologies are not claimed by themselves. However, the present invention uses existing infrastructure in new ways and adds incremental improvements to that infrastructure.

#### Overview

The inventive approach shown in FIG. 5 does bear some resemblance to the conventional approach shown in FIG. 4. As in FIG. 4, the transaction is between at least one seller 500 and at least one buyer 502, and if all goes well then the seller receives payment and the buyer receives goods.

However, in any given embodiment of the invention, there are one or more significant differences between the invention, on the one hand, and conventional tools or techniques on the other hand. These differences may include the parties participating, the goods involved, the samples involved, the path taken by the goods, the path taken by the payment, and the type and level of trust required. Although they are related and may be combined in inventive embodiments, we consider each of these in turn below.

For clarity of illustration, negotiations between parties are not shown in FIG. 5 or subsequent Figures, but it should be understood that such negotiations may occur at zero or more points during a given transaction according to the present invention. Also, transactions according to the invention may involve more than one buyer and/or more than one seller; for clarity of illustration, only a single seller 500 and a single buyer 502 are shown in the Figures.

#### Parties

One difference between the conventional approach illustrated in FIG. 4 and the inventive approach shown in FIG. 5 is the presence of an automatic broker 504. The automatic broker 504 is identified in the priority application Serial No. 60/134,383 as "Q", and is identified herein as "Q", "the broker", "broker 504", "automatic broker", etc. In some embodiments, the automatic broker 504 supplements or replaces the conventional agent A discussed in the Technical Background section above by escrowing goods, completing transactions, and so on. As indicated in FIG. 4, conventional agent A is an attorney, escrow firm, or other person or institution known before the present invention. In other embodiments, the broker 504 is used by an agent A or another transaction party to generate samples.

The automatic broker Q may be implemented as an automatic impartial broker in computer hardware and/or software according to the invention. For instance, Q may be embodied in novel software running on general-purpose hardware. Q could also involve novel hardware. The invention is not limited to Q but also includes related signals, and methods using Q such as business methods for transacting digital content sales. Q's impartiality is preferably reasonably protected through encryption, certification, anti-virus protection, and like measures, to prevent intervention by untrustworthy parties. Untrustworthy parties are those who would unfairly take advantage of others' trust in Q. For instance, an untrustworthy party might try to take unfair advantage of others' reliance on the assumption that Q will complete the transaction if and only if the buyer(s) and the seller(s) expressly advise Q of their consent to such completion.

When properly implemented, the automatic broker Q is not subject to temptation. Thus, if the broker Q is programmed by persons having trustworthy intent and adequate technical skills, Q will be impartial in the sense that it may be entrusted with transaction facilitation tasks with fewer trust-related risks than in some conventional approaches.

## Goods

In a conventional transaction like that shown in FIG. 4, the goods are not necessarily digital. By contrast, transactions with the automatic broker 504 involve at least some digital goods 506; non-digital goods may or may not also be involved. In some embodiments, the goods 506 are digital in the sense that they include digital content such as bits, files, databases, etc. which are placed in escrow with the broker 504, to be released by the broker 504 as part of transaction completion. In some embodiments, the goods 506 are digital in the sense that their digital content serves as an original (i.e., an initial copy) from which the broker 504 creates samples 508 as discussed herein.

In some transactions, the digital goods 506 are the only goods that are subject to the transaction at hand. In other transactions, rights in non-digital goods may also be transferred, as when a seller provides both a digital technical description of some chemical composition, and physical pieces of that composition for spectrographic or other physical inspection. Of course, other non-digital goods may be treated similarly, as when samples are extracted or test data is provided on alloys, minerals, agricultural products, and so on.

In some transactions, the digital goods 506 represent or replicate non-digital goods. For instance, the digital goods could include seismic records indicating the nature and extent of petrochemical deposits; satellite images; or instrument readings or traces, including, for instance, output from medical imaging devices such as CAT or NMR scans, from chemical analysis tools such as gas spectrometers, from physics instruments such as electron microscopes, or from other instruments whose data can be checked by the buyer for internal consistency and whose data provide the buyer with pertinent information about the physical goods.

## Samples

Conventional transactions involve no samples at all, or involve samples of conventional types. Conventionally, samples are provided by sellers in the form of physical pieces of the goods, as when part of a fluid good is siphoned off to be tested, or when one free pen or other specimen of a mass produced item is provided to encourage purchase of additional copies. Conventional samples of software are often provided in the form of "demo" software which runs but has only a subset of the functions of the regular product and/or has a built-in limit on the duration of use and/or the total number of uses. Although catalog descriptions and images are not the same as samples of the described and depicted items, conventional catalog entries are used to convey product information and encourage purchase, which are also common goals when providing demo versions, specimens, or other conventional samples.

By contrast, samples 508 are provided by the broker 504. Unlike transactions in which the seller provides the sample directly to the buyer or provides the agent A with the sample to be given to buyers, in some embodiments of the invention the seller 500 does not directly generate the sample 508. Instead, the automatic broker 504 generates the sample. Indeed, in some transactions, the seller 500 never receives a copy of the sample 508 from the broker 504.

In addition, embodiments of the invention permit samples 508 to be more than "siphoned off" specimens. Content for a sample 508 may be extracted from the content of the goods 506, but the extraction can be performed in various ways, and it may depend on the type of digital good 506 involved. Content for a sample 508 may also be obtained by other techniques, such as by distorting or enhancing the content of the goods 506.

## Path of the Goods and the Payment

In some conventional transactions, like those illustrated in FIG. 4, goods are shipped directly from the seller to the buyer. This may be done in transactions according to the present invention. However, digital goods 506 can also be escrowed with the automatic broker 504, to be released automatically to the buyer 502 after payment is made.

Likewise, in conventional transactions payment may be sent directly from the buyer to the seller. This may also be done in transactions according to the present invention. However, a digital payment 510 can also be escrowed with the automatic broker 504, to be released automatically to the seller 500 after the goods 506 are provided.

In particular, FIG. 5 illustrates an embodiment of the invention in which neither the goods nor the payment are provided directly by one of the human parties to the other. Instead, the goods 506 and the payment 510 are each escrowed with the automatic broker 504. Only after it receives both the goods 506 and the payment 510 does the broker 504 release them to the other party (by sending 512 the payment to the seller 500 and sending 514 a copy of the digital goods 506 to the buyer 502). This approach requires the seller 500 and the buyer 502 to each trust the automatic broker 504, rather than asking them to trust each other. For instance, the seller 500 need not worry that the buyer 502 will receive a useable copy of the goods 506 without the seller 500 being paid, and the buyer 502 need not worry that the seller 500 will receive payment without the buyer 502 receiving a useable copy of the goods 506.

## Trust Issues

As noted, some embodiments of the invention shift the trust required from trust in the other party to trust in the automatic broker. This may facilitate transactions that would otherwise not occur. When properly implemented and administered, the automatic broker is preferably an impartial entity. That is, the broker's behavior does not unfairly favor any human party over any other human party in the transaction.

Moreover, people may perceive the automatic broker as more trustworthy than human agents, because machines are usually not subject to human emotions such as greed, fear, or hatred that sometimes skew transactions between people. This does not mean a severely mechanistic interface, such as a sequence of forms, would necessarily be best. People sometimes reveal confidences or otherwise place trust in programs that mimic people, such as the ELIZA program, so a natural language interface could also be used in embodiments of the automatic broker.

A legally binding confidentiality or non-disclosure agreement is used in some embodiments of the invention, to assure sellers that the buyer will not disclose confidential sample contents, for instance. Unlike conventional transactions, however, the invention provides a way for prospective buyers to inspect digital goods without necessarily obtaining a complete and useable copy of those goods.

Instead, the samples 508 permit sellers to provide buyers with enough information to permit inspections of quality and/or extent without forcing sellers to rely solely on legal means (e.g. contract or copyright law) or business ethics to prevent buyers from unauthorized use of easily reproduced digital goods. This encourages sellers to make goods available for inspection, which facilitates transactions. Some embodiments of the invention also remove the selection of samples 508 from the control of the seller. This encourages buyers to rely on the samples as accurate guides to the content of the digital goods 506, which also facilitates transactions. In short, the invention reduces or eliminates questions of trust which inhibit transactions in digital content.



FIG. 5 is not comprehensive. To further illustrate the invention, we now consider some additional examples, using both the notation introduced earlier and additional Figures. The Figures and the notational examples do not necessarily correspond precisely with each other as representations of the invention. That is, the Figures illustrate inventive embodiments or aspects thereof which are not called out expressly in the notation examples, and vice versa. Also, some embodiments of the present invention mix elements which are set forth in the Figures with elements set forth in the notational examples.

#### Additional Goods-for-Payment Transactions

FIG. 6 illustrates an embodiment similar to that shown in FIG. 5, with the addition of a step transmitting the samples 508 to the seller. That is, in this embodiment the seller 500 receives a copy of the samples that are created by the broker 504 and then provided by the broker 504 to the buyer 502 for inspection.

By contrast, the seller in FIG. 5 only obtains a copy of the samples 508 if the buyer sends it one. The seller does not provide the samples to the broker 504 for forwarding (the broker creates the samples), and the broker 504 does not provide the seller with a copy of the samples the broker creates.

In conventional approaches, a seller of digital goods has the opportunity to inspect copy of the samples that the buyer receives, either because the seller creates the samples itself or because the seller knows in advance what techniques will be used to create the samples. For instance, a seller of images may itself conventionally create thumbnail samples, or the seller may conventionally use software tools which will create thumbnail samples on the seller's behalf using techniques whose details are not necessarily understood by the seller but whose results are readily predicted by the seller.

In the embodiment shown in FIG. 6, by contrast, the broker 504 creates the samples 508 using techniques whose results are not necessarily known ahead of time to the seller 500. Because the seller 500 cannot easily predict what algorithms will be used to create the samples from the goods 506 provided to the broker 504 by the seller, the invention can make it difficult or impossible for the seller to trick the broker into sending the buyer 502 samples that are not accurate guides to the nature and extent of the digital goods.

The samples 508 may be provided to the seller for one or more purposes. For instance, the techniques used to create the samples may be challenged by the seller, in which case the buyer and seller may agree that the broker should produce a second (or third, fourth, etc.) sample using a different technique. Note that the broker 504 preferably uses a subsequent sampling technique which produces a subsequent sample that cannot be combined with the previous sample(s) to obtain a complete and useable copy of the goods. Sampling should allow inspection without permitting full use of the goods.

FIG. 7 illustrates embodiments in which the automatic broker 504 releases 514 the goods at a substantially different time than it releases 512 the payment. In FIG. 7, the goods 506 are released before the payment 510, but other embodiments similarly release the payment 510 before releasing the goods 506. Either approach creates a risk that the broker 504 will be unable to complete the transaction. For instance, the broker 504 or the network might be attacked after the payment 510 has been transmitted but before the goods 506 are transmitted. Nonetheless, releasing the payment 510 and the goods 506 at different times may be desired for convenience, by mutual agreement of the parties, to take

advantage of network bandwidth (goods will generally be larger than payments, in terms of bandwidth required for transmission), and/or for other reasons.

#### Barter Transactions

FIG. 8 illustrates barter embodiments in which the buyer and seller each provide the other with digital goods, as opposed to situations in which the seller provides digital goods and the buyer provides digital cash or similar liquid payment. The seller places 800 its digital goods in escrow with the broker 504, which obtains samples thereof and then sends 802 the samples to the buyer. Likewise, the buyer places 804 its digital goods in escrow with the broker 504, which obtains samples that it sends 806 to the seller. At this point, the broker 504 has the digital content that was submitted by each party 500, 502, and each party 500, 502 has samples of the other's digital content. The samples were preferably produced by techniques not chosen by the parties, but selected instead by the broker 504, so that each party can rely on the samples as representative of the goods being proposed by the other party for the exchange.

If each party 500, 502 is satisfied with the other's goods, as represented by the sample it received from the broker 504, then each party gives its approval to the broker 504. The broker 504 then completes the transaction by releasing 812, 814 each party's goods to the other party.

If either party is unsatisfied with the samples or wishes to cancel the deal for some other reason, it can withhold its approval, and the transaction will time out without being completed. Alternately, a party can expressly cancel the transaction. In either case, the broker deletes the escrowed goods. The broker 504 may also overwrite the hard disk, RAM, and/or other memory that held the parties' digital content, using an electronic "shredding" algorithm such as that employed by various known products for military and other security purposes.

Barter transactions are also illustrated in the following method for facilitating barter transactions involving digital content, the digital content provided by at least two parties, the method comprising the steps of:

- receiving from a first party a copy of first digital content and escrowing that first digital content;
- receiving from a second party a copy of second digital content and escrowing that second digital content;
- determining an approval exists to release the first digital content to the second party;
- determining an approval exists to release the second digital content to the first party;
- releasing the first digital content to the second party; and
- releasing the second digital content to the first party.

In some embodiments, at least one of the determining steps comprises receiving an approval from the party that provided the digital content being approved for release. In others, lack of disapproval is taken as approval, so at least one of the determining steps comprises timing out after no cancellation is received from the party that provided the digital content being approved for release.

In some embodiments the method further comprises the steps of creating a sample of digital content, and sending the sample to at least one of the parties prior to at least one of the determining steps. If the digital content includes an image, for instance, then the step of creating a sample could create a thumbnail of the image. Thus, the exchange may be based on an inspection by one or more parties of samples taken from the goods proposed by other parties for exchange.

More generally, in these and other transactions according to the invention each party provides the other with compo-

nents in the form of liquid payment, digital goods, non-digital goods, and/or legally binding promises, in varying mixtures, including mixtures that omit one or more such components. To give just two of the many possible examples, rather than exchanging payment for goods, the parties could exchange goods for goods (per FIG. 8), or they could exchange payment for a time-limited option on the goods. That is, a "sale" of digital goods includes a lease, or an exchange for other goods or services, or legal promises, or liquid payment. This makes the terms "buyer" and "seller" broader than would otherwise be the case, since a "buyer" may receive payment and a "seller" may receive goods, but the terms are convenient so we use them nonetheless. Also, barter transactions may provide payment as well as goods, and payment transactions may provide goods as well as payment.

#### Samples vs. Transactions

FIG. 9 illustrates embodiments of the invention which facilitate transactions but do not necessarily include any particular transaction completion. In these situations the seller 500 does not necessarily know the identity of the prospective buyer 502. Indeed, in some cases, the seller does not even know whether there presently are any prospective buyers. Rather, these embodiments employ the novel sampling aspects of the invention to make samples available at web sites, FTP sites, bulletin boards, and/or other locations that are accessible to some population that may include one or more buyers.

That is, the seller 500 provides 900 a copy of its digital content to the broker 504. The broker 504 then obtains 902 one or more samples, by using extraction, distortion, enhancement, or a combination thereof on the provided digital content, as taught herein. Then the broker provides 904 the samples by placing copies of them on the web site, FTP site, and/or bulletin board to permit access by prospective buyers 502.

In one alternative, the seller uses the broker 504 to obtain the samples and does not necessarily rely on the broker to complete the transaction by transmission of goods from the broker 504 to the buyer 502. Indeed, in some embodiments, the goods are not retained by the broker 504, but are instead made available to the broker 504 by the seller 500 merely to permit the broker to create the samples, which the broker 504 then gives to the seller. The seller 500 then proceeds as it sees fit, such as by requesting that the broker create different samples using different techniques, and/or by providing the samples directly to a prospective buyer rather than going through the broker 504 to pursue or complete a transaction.

#### Additional Transaction Examples

Turning now from the Figures back to the notational examples, consider the following transaction T4Q involving seller S, buyer B, and the novel computerized element Q 504 in generally the position taken earlier by the human agent A. This transaction was described in the priority application No. 60/134,383 and is repeated here for completeness and convenience:

1.  $\text{?(S-D->B)} \parallel \text{?(S-M->B)}$
2.  $\text{?(S<-N->B)}$  // could also precede (n), or precede and follow, or overlap
3.  $\text{Q<-\$-B}$  // novel software receives money from buyer and holds or escrows it
4.  $\text{S<-OK-Q}$  // software Q confirms to S that Q has payment
5.  $\text{S-G->B}$
6.  $\text{S<-OK-B} \parallel \text{Q<-OK-B}$  // B OK's goods and OK's payment completion
7.  $\text{S<-\$-Q}$  // Q releases funds to S

When properly programmed and operating, Q can be trusted by buyer B not to abscond with the payment \$ after step (3). B can also trust Q to perform step (7) when, and only when, approval is given to Q by B in step (6). Likewise, Q can be trusted by S not to take the payment and disappear after step (3), and can likewise be trusted not to deny receiving the payment (no step (4)).

A variation T4Q' involves transferring the goods to Q and then releasing them; the trust issue analysis is similar to that above for T4N:

1.  $\text{?(S-D->B)} \parallel \text{?(S-M->B)}$
2.  $\text{?(S<-N->B)}$  // could also precede (n), or precede and follow, or overlap
3.  $\text{S-G->Q}$  // novel software receives goods from seller and holds or escrows them
4.  $\text{Q-OK->B}$  // software Q confirms to B that Q has goods
5.  $\text{S<-\$-B}$
6.  $\text{S-OK->Q} \parallel \text{S-OK->B}$  // S OK's payment and OK's goods transfer to B
7.  $\text{Q-G->B}$  // Q releases goods to B

Note that Q could "have" the goods and/or "release" the goods either by having proof in digital form from a bank or government agency or highly trusted third party that the goods are under Q's control, or by having physical oversight of the goods when the goods are digital in nature. That is, Q could know the storage location of the digital goods and have control (through encryption, access control lists, firewalls, groups, permissions, tokens, and/or other familiar access control tools and techniques) of those digital contents.

A transaction T5Q involving novel automatic broker Q goes like this:

1.  $\text{?(S-D->B)} \parallel \text{?(S-M->B)}$
2.  $\text{?(S<-N->B)}$  // could also precede (n), or precede and follow, or overlap
3.  $\text{(Q<-\$-B} \parallel \text{S-G->Q)}$  // broker receives money from buyer and goods from seller
4.  $\text{(Q-OK->B} \parallel \text{S<-OK-Q)}$  // broker confirms goods & payment OK and in hand
5.  $\text{(Q-G->B} \parallel \text{S<-\$-Q)}$  // broker releases goods to buyer & payment to seller

Again, Q can be both trustworthy and trusted if properly implemented. Q would not intentionally retain illegal possession of both the goods and the money after step (3). Q would not intentionally misrepresent the amount or quality or receipt of the goods and/or money in step (4). Q would not intentionally defraud a party by releasing an item (goods or payment) to one party without releasing the corresponding item to the other party in step (5). Q would be programmed to be impartial, and programmed to protect that impartiality from being overridden, regardless of whether S, B, or some third party is behind the override effort.

Impartiality of software in the context of a business exchange has been recognized as valuable, at least implicitly, by the creators of the cyberSettle.com web site. The software available through that site accepts settlement offers, holds them confidential, compares them, and announces a settlement if they fall within a predetermined distance of each other. However, cyberSettle.com apparently does not broker transactions between buyers and sellers of goods, much less between buyers and sellers of digital goods. It is also believed by the inventor that cyberSettle.com does not teach the present invention's tools and techniques for obtaining and/or using samples of digital content.



In addition to the broker, the seller(s), and the buyer(s), a transaction according to the invention may include other entities. For instance, A transaction T7 uses both Q and a third party financial institution F, such as an electronic banking facility:

1. ?(S-D->B)
2. ?(S<-N->B) // could also precede (n), or precede and follow, or overlap
3. S-G->Q
4. Q-X->B || ?(S<-X-Q) // S might get X so S knows basis for B's view of G
5. ?(S<-N->B) // parties might renegotiate after B views X
6. (F<-S-B) // B will pay this much for G based on sample X
7. (Q<-OK->F) // Q verifies funds transfer from B with F; Q OK's F paying S
8. (Q-G->B || S<-S-F) // broker releases goods to buyer & F pays seller

Note that in any or all of the various transactions using Q and/or X, the parties S and B might prefer to remain anonymous (subject to any applicable legal requirements). Anonymous remailers, anonymous funds transfers, anonymous logins, and/or email aliases could be used. This anonymity reduces the risk of being overpowered by the other party, such as the risk in transaction T3. It may also promote transactions between parties that would otherwise not deal with each other for historic reasons that have little or nothing to do with the particular goods in question.

Note that Q (and Q with F) can reduce trust issues in transactions, but cannot entirely eliminate them. For instance, in some contexts, knowledge of the number of copies of the digital content may be important. However, the inventive tools and techniques cannot guarantee that the copy of digital goods G sold to B is unique. S may have retained a copy and/or sold another copy to some other buyer B'.

#### Digital and Other Goods

Suitable digital content and/or digital goods include executable software; software source code; email and other mailing lists; databases of various types and formats, such as relational, object-oriented, or hierarchical databases; CAD files; scanned documents; word processor or spreadsheet documents; web pages; scripts; digital or digitized photographs, video, sounds; multimedia presentations; patent applications, design documents, and other scientific and technical information in computerized form; multimedia presentations and courses; digital images (still, user-navigable 360-degree, and video); digital sounds; digital movies and other entertainment content; and a wide variety of other digital content. The collection of suitable digital content may well grow over time. For instance, in addition to sounds and images, it is also apparently possible to digitally encode smells. One could thus expect efforts to digitally encode tastes, if such efforts are not already underway.

The digital content may be in plain form, or the user or other entities or agents (e.g., system software) may have encrypted and/or compressed the digital content. The result of encrypting and/or compressing digital content is still digital content.

Securities, stocks, bonds, futures, notes, mortgages, and such financial instruments are not "digital goods." However, one or more such items may serve as "payment" in an embodiment of the invention that requires a payment.

As used herein, "digital" includes both content that was originally generated in digital form and content that was

converted (e.g., digitized) into a digital form from a non-digital form via scanning, conventional sampling, and/or another process.

The terms "digital content" and "digital goods" are equivalent, at least from the perspective of obtaining samples, releasing content, and similar operations performed by the broker 504. Using both terms provides a more accurate impression of the invention's scope. Using "digital goods" alone might give the mistaken impression that works of art or scientific research cannot be exchanged according to the present invention, while using "digital content" alone might give the mistaken impression that only works from so-called "content providers" can be thus exchanged.

#### Obtaining and Using Samples

When the goods involved are digital, the automatic broker Q can reduce risks arising from descriptions and/or samples that are not representative of the actual goods. The term "sample" has special meaning when used in reference to certain embodiments of the present invention, namely, those in which the sample is characterized in that its content is not predicted by the seller, whereby the sample contains useful information about the digital content without containing a complete and accurate copy of the digital content. In other embodiments, "sample" may refer to conventional samples (obtained by conventional techniques such as creating a thumbnail of an image or quoting an excerpt from a text) or "sample" may refer to samples obtained by novel techniques like those described herein.

As illustrated in FIG. 10, with respect to the invention, sampling techniques 902 include selecting 1002 a subset of existing data, distorting 1004 data, and/or enhancing 1006 a data set. That is, a novel sample X may be created by selecting content from digital goods 900 in a previously unknown way, by distorting content from digital goods 900, and/or by adding specified content to digital goods 900. As noted, the digital goods 900 may be supplied to the broker 504 by one or more sellers and/or buyers. A transaction involving the samples may be completed by the broker 504 as intermediary, or it may be completed by the parties without further use of the broker 504 once the broker provides the sample(s).

Note that conventional sampling by selecting a portion of non-digital goods is well-known in conventional transactions. Embodiments of the present invention provide novel samples, novel transactional uses of samples extracted from digital data by conventional techniques, and/or novel techniques for obtaining samples from digital goods. For instance, conventional tools and techniques for string manipulation, search/replace, numerical calculations, flow control, lookup tables, bit-shifting, user-defined functions, and callable DLLs may be used according to the present invention to create samples whose content is not predicted by a seller and is therefore less subject to manipulation by the seller.

To illustrate the use of samples, consider the transaction T6Q described by the notation below. A sample X is extracted from the digital goods by the broker Q in a manner which is not necessarily known beforehand by seller S and which is selected to make the sample X a poor or worthless substitute for the sampled goods G themselves:

1. ?(S-D->B)
2. ?(S<-N->B) // could also precede (n), or precede and follow, or overlap
3. S-G->Q
4. Q-X->B || ?(S<-X-Q) // S might get X so S knows basis for B's view of G
5. ?(S<-N->B) // parties might renegotiate after B views X

6. (Q<-\$-B) // B will pay this much for G based on sample X

7. (Q-G->B || S<-\$-Q) // broker releases goods to buyer & payment to seller

The tools and techniques used to extract samples such as X may vary. For instance, if digital content includes an email list in ASCII text, a sample could contain every fourth character (or Nth character, with a small N>1). This partial copy allows a buyer to verify the lack of duplicate entries in the list, the geographic area covered by the list, the number of list entries, and so forth, without simply giving the complete list to the buyer in useable form before the buyer pays for the complete list. Samples may be free, or they may be given in exchange for some item of value (e.g., cash, goods, services, or samples of other goods).

Similar steps could be taken with source code and other human-readable documents to make samples helpful to buyers without leaving sellers too vulnerable. Sampling 902 allows the prospective buyer to evaluate the credibility of the seller's claims about the digital goods without fully revealing the content of the goods and thereby making payment unnecessary if the buyer is not bound in fact by contract, copyright, ethics, or other constraints that encourage or ensure payment.

Care is preferably taken to prevent a seller S from intentionally providing damaged or incomplete goods by anticipating the sampling technique used to create X. For instance, suppose a mailing list is represented by the seller to contain several thousand different entries, but this is not actually the case. If the seller knows that samples of the list will be produced by extracting every fiftieth entry, then the seller can inflate the list to fifty times its valid size by repeating each valid entry an additional forty-nine times. Sampling will indicate that the list contains much more valid data than is actually the case. If the buyer and seller are in separate legal jurisdictions, are dealing with one another anonymously, or the buyer's legal and business recourse is otherwise limited, then the seller could gain an unfair advantage from the buyer's reliance on the sample.

To avoid this and similar situations, the seller should not know what sampling technique(s) will be used. It should also be difficult or impossible to reconstruct the original digital content from the sample if the sampling technique is not known, and in cases involving partial copies, even if the technique is known.

If the digital content includes photos, then the samples might be thumbnails, or "pixelated" (adjacent pixels averaged) images, or images that include only some color components or lack an alpha channel. Similar techniques for creating 1002 partial copies could be used with digital sounds, such as sampling at fixed intervals, or providing some but not all channels of a multi-channel digital audio recording.

To distort 1004 and/or burden 1106 the content during sampling, X could be watermarked or otherwise marked through steganographic techniques. Steps could also be taken to prevent use or reproduction of a sample X, such as using a Java applet to display X while preventing a copy of X from being made on buyer B's hard disk or printed. A copy of the original digital content could also be distorted 1004 by shifting colors in images, shifting frequency in images or sounds, adding noise to images or sounds or other content, or reordering the order of words or sentences in text.

Note that the sampling technique selection, like the application of the technique by Q, can be partially or fully automated. If a lookup of the filename extension, confirmation of a header signature or other pattern, or some other

programmed test identifies the data type, automatic selection by Q can be used. Likewise, a given implementation of Q may be limited to a single data type, such as "ASCII prose" or "XML text" or "patent applications in Microsoft Word format". Alternately, the parties S and B may agree on a general class of sampling techniques and/or inform Q of the data type.

Tailoring the sampling technique to the type of digital content may be convenient in some cases, and critical in others. This depends in part on the categories used to define content types. For instance, an ASCII mailing list and an ASCII word processor file might both be categorized as "ASCII text", and sampling could be done by deleting every Nth (with N=3, 4, or 5, for example) character. Alternately, "mailing list in ASCII text form" and "documents other than mailing lists, in ASCII text form" might be separate data categories subject to different sampling techniques. For instance, the mailing list might be parsed and the sample be produced 1002 by deleting all the recipient names and numeric portions of street addresses while leaving the postal codes. Non-mailing list documents could still be sampled, very quickly and without significant parsing, by deleting every Nth character.

Content categories can be defined by defaults programmed into the broker Q, by definitions given by seller and/or buyer, or by a combination of these sources. File extensions, keywords, and other familiar indicators can be used to identify the formats of inputs to Q for sampling, and thus to identify in at least some cases the likely nature of the digital content and the type of sampling techniques to use.

Familiar techniques such as timestamps, checksums, secure digital envelopes, watermarks, and/or digital signatures can be used to permit buyers and/or sellers to authenticate the samples they receive, to ensure that the samples arrive intact as produced 902 by the broker. For instance, watermarks and/or digital signatures may be embedded in the sample (or equivalently, in a digital envelope containing the sample) as authentication information, thereby permitting authentication which verifies that the automatic broker tool is the source of the sample.

More generally, encryption, passwords, public keys, tokens, Secure Sockets Layer transmissions, and other familiar tools and techniques can be used to provide secure communications between the parties and the broker 504, and/or between the parties 500, 502 themselves, to protect samples, digital goods, payment information, and other data. Authentication may also be required of the seller and/or the buyer in some embodiments.

Note that in embodiments that use the broker 504 only to create the samples, the broker 504 might run at the seller's site, making an SSL or other secure network connection between broker and seller unnecessary. If the seller or an agent A will provide the samples to the buyer, then the broker 504 preferably digitally signs or watermarks the samples, to permit authentication of the broker 504 as the source of the samples.

To illustrate the sampling step 902 further, assume the following source code is part of the digital content which is offered for "sale" (that is, in an exchange for cash payment or for other goods or services) in a particular transaction:

```
flen: Integer;
Begin
With Database^.Tag_Ptr[Ptr]^,Database^ do
Begin
Fillchar(Tag_Line[1],80,' ');
Tag_Line[0] := chr(80);
If (length(Group)>0) and (length(Group)<5) then
```

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```

Move(Group[1],Tag_Line[2],length(Group));
If (length(Tag_Id)>0) and (length(Tag_Id)<11) then
  Move(Tag_Line[1],Tag_Line[7],length(Tag_Id));
If (length(Tag_Desc)>0) and (length(Tag_Desc)<31)
  then
    Move(Tag_Desc[1],Tag_Line[18],length(Tag_
      Desc));
If Cur_State in [0 . . . 16] then
  Begin
    Textcolor(Colors[Cur_State]);
    Move(State[Cur_State],Tag_Line[49],6);
  End;
End;

```

Some sampling techniques create 1002 a sample X which is a partial copy of the original copy of the source code. In the following example, the sample is created 1002 by removing all array indices and any other characters that appear between matching square braces [ and ], so the sample X looks like this:

```

flen: Integer;
Begin
  With Database^.Tag_Ptr[ ]^,Database^ do
    Begin
      Fillchar(Tag_Line[ ],80,' ');
      Tag_Line[ ] := chr(80);
      If (length(Group)>0) and (length(Group)<5) then
        Move(Group[ ],Tag_Line[ ],length(Group));
      If (length(Tag_Id)>0) and (length(Tag_Id)<11) then
        Move(Tag_Id[ ],Tag_Line[ ],length(Tag_Id));
      If (length(Tag_Desc)>0) and (length(Tag_Desc)<31)
        then
          Move(Tag_Desc[ ],Tag_Line[ ],length(Tag_Desc));
      If Cur_State in [ ] then
        Begin
          Textcolor(Colors[ ]);
          Move(State[ ],Tag_Line[ ],6);
        End;
    End;
  End;

```

Some sampling techniques create a sample X which is a partial copy of the original copy of the source code and is also distorted 1004. In the following example, the sample is created by replacing every fifth character by the character "4" (that is, by distorting every fifth character into a "4") so the sample X looks like this:

```

flen4 Int4ger;4Begin4
Wit4 Dat4base4.Tag4Ptr[4tr]^4Data4ase^4do
  4egin4 Fil4char4Tag_4ine[4],804' ')4
  Ta4_Lin4[0] 4=ch4(80)4
  If4(len4th(G4oup)40) a4d (l4ngth4Grou4)<5)4then4
  Mo4e(Gr4up[14,Tag4Line42],l4ngth4Grou4));
  4If (4engt4(Tag4Id)>4) an4 (le4gth(4ag_4I4)<114 the4
    M4ve(T4g_Id41],T4g_Li4e[7]4leng4h(Ta4_Id)4;
  I4 (le4gth(4ag_D4sc)>4) an4 (le4gth(4ag_D4sc)<41) t4en
  4Move4Tag_4esc[4],Ta4_Lin4[18]4leng4h(Ta4_Des4));
  4If C4r_St4te i4 [0.416] 4then
  4Beg4n
    4extc4lor(4olor4[Cur4Stat4]);
  4 Mov4(Sta4e[Cu4_Sta4e],T4g_Li4e[494,6];4 En4;
  E4d;
E4d;

```

Sampling techniques may sometimes be characterized in more than one way. For instance, the first sampling

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approach, which removed characters found between square brackets, could also be characterized as an approach that distorts the characters between square brackets into nonexistence.

5 Another sampling technique creates 1002, 1004 a sample X which is a partial and distorted copy of the original copy of the source code by replacing every other numeric character by the character "0", so the sample X looks like this:

```

flen: Integer;
10 Begin
  With Database^.Tag_Ptr[Ptr]^,Database^ do
    Begin
      Fillchar(Tag_Line[1],00,' ');
      Tag_Line[0] := chr(80);
      If (length(Group)>0) and (length(Group)<0) then
        Move(Group[1],Tag_Line[0],length(Group));
      If (length(Tag_Id)>0) and (length(Tag_Id)<01) then
        Move(Tag_Id[0],Tag_Line[7],length(Tag_Id));
      If (length(Tag_Desc)>0) and (length(Tag_Desc)<30)
        then
          Move(Tag_Desc[1],Tag_Line[08],length(Tag_
            Desc));
      If Cur_State in [0 . . . 10] then
        Begin
          Textcolor(Colors[Cur_State]);
          Move(State[Cur_State],Tag_Line[40],6);
        End;
      End;
    End;

```

Source code is just one example of digital content that can be sampled 902. Non-textual digital content can also be sampled, as when image pixels, image voxels, or discrete elements of a digital sound recording are omitted or distorted.

As another example of digital content which is textual, but is not source code, consider the following excerpt from U.S. Pat. No. 3,999,789:

40 Bearing 100 supports the tailpiece driver 102 that extends from key lock 70. This tailpiece 102 thus extends through the matching opening in security dead bolt swivel 72, through bearing 100, through elongated vertical slot 98 of slide 90, through matching opening 96a in driven cam 96, and into a matching opening in turnpiece 68, all as shown in FIG. 3. Therefore, rotation of the cylinder lock and tailpiece 102 by a key 71 will rotate dead bolt swivel 72 to extend or retract dead bolt 58, depending upon the direction of rotation, and will also rotate cam 96 and turnpiece 68. Likewise, rotation of turnpiece 68 will rotate tailpiece 102 to rotate, i.e. pivot cam 96, and rotate dead bolt swivel 72. Tailpiece 102 in conventional fashion has a flat elongated configuration with a generally rectangular cross section, there being a corresponding cross section in the opening of swivel 72, and in opening 96a of cam 96 as well as the opening in turnpiece 68.

Like other technical texts or marketing texts, for instance, patent or patent application text can be sampled 902 in various ways. For instance, here is a partial copy of the excerpt given above, with every third sentence removed 1002 by sampling; omission locations are marked here for clarity of illustration but would not necessarily be marked in every sample:

65 <omitted> This tailpiece 102 thus extends through the matching opening in security dead bolt swivel 72, through bearing 100, through elongated vertical slot 98



of slide 90, through matching opening 96a in driven cam 96, and into a matching opening in turnpiece 68, all as shown in FIG. 3. Therefore, rotation of the cylinder lock and tailpiece 102 by a key 71 will rotate dead bolt swivel 72 to extend or retract dead bolt 58, depending upon the direction of rotation, and will also rotate cam 96 and turnpiece 68. Tailpiece 102 in conventional fashion has a flat elongated configuration with a generally rectangular cross section, there being a corresponding cross section in the opening of swivel 72, and in opening 96a of cam 96 as well as the opening in turnpiece 68.

Alternatively, text could be sampled 902 to create a distorted and partial copy using a "dictionary scramble" technique. The text is at least partially scanned, and a dictionary of words used in the text is created. The selected words are placed in an order; this could be the order in which they were encountered, or alphabetic order. Then replacements are made in a copy, by substituting a second word in the list for a first word in the list each time the first word is encountered in the copy. The modified copy will be the sample.

In the example below, the dictionary listing used is "Bearing, 100, supports". In this example, two passes are made through the text, and during each pass each instance of a currently selected dictionary word is replaced by the word two positions further along in the dictionary list. Thus, instances of "Bearing" are replaced by "supports", and then instances of "100" are replaced by "Bearing":

Supports bearing supports the tailpiece driver 102 that extends from key lock 70. This tailpiece 102 thus extends through the matching opening in security dead bolt swivel 72, through supports bearing, through elongated vertical slot 98 of slide 90, through matching opening 96a in driven cam 96, and into a matching opening in turnpiece 68, all as shown in FIG. 3. Therefore, rotation of the cylinder lock and tailpiece 102 by a key 71 will rotate dead bolt swivel 72 to extend or retract dead bolt 58, depending upon the direction of rotation, and will also rotate cam 96 and turnpiece 68. Likewise, rotation of turnpiece 68 will rotate tailpiece 102 to rotate, i.e. pivot cam 96, and rotate dead bolt swivel 72. Tailpiece 102 in conventional fashion has a flat elongated configuration with a generally rectangular cross section, there being a corresponding cross section in the opening of swivel 72, and in opening 96a of cam 96 as well as the opening in turnpiece 68.

Of course, many other sampling techniques can also be used according to the present invention. For instance, the broker 504 could also scramble 1004 data to create a sample. Scrambling could mismatch names and addresses in a mailing list so that each name or address is individually correct but the names do not always match the indicated addresses. Similarly, scrambling could transpose entries in a table of numeric values, or it could change the order of statements in program source code. Scrambling and/or other distortions could be combined with omission, so that a portion of the data is first extracted and then distorted to create the sample.

The broker could also mix 1006 spurious data into a copy of the original digital content, such as by adding spurious addresses to a mailing list, adding spurious values to tables of data values, or adding spurious statements to source code. The presence of spurious data in maps, and of "bugs" in source code, has been used conventionally to show copy-right infringement, but the use of such data according to the present invention to provide a digital sample 508 to facilitate commerce is believed to be novel.

For instance, spurious source code could be added 1006 by copying a loop or a function call, altering numeric parameters, and then inserting the resulting spurious code before or after the original code loop or function call. This technique has a good chance of breaking the sample's functionality to make it unsuitable for normal use as digital goods, as desired, without making the spurious addition easy to identify or remove. The modified code will usually still compile and link with the same error messages, or lack thereof, as it did before sampling 902.

#### Catalogs

Some embodiments provide a catalog containing samples according to the invention. This permits prospective buyers to inspect samples without making the sampled goods easily available for unauthorized use. Like conventional catalogs, catalogs according to the invention may contain text and/or pictures describing the offered products and services. The catalog may also contain samples of software that are conventional in the sense that they provide only a limited subset of functions (e.g., no print capability) and/or stop working after a previously specified number of uses or a previously specified period of time has passed. But the novel catalogs also have sampled 902 content according to the invention.

#### Systems and Devices

FIGS. 11 and 12 illustrate some of the many possible configurations of systems and devices suitable for use according to the present invention. In FIG. 11, a seller computer 1100 and a buyer computer 1102 are each connected to a server 1104 that runs automatic broker 504 software. The seller connection 1106 and the buyer connection 1108 are not necessarily identical in bandwidth, latency, geographic scope, networking protocols, addressing, or other characteristics. Either or both connections 1106, 1108 may include local area network, Internet, or other network connections, including wired or wireless connections, intervening routers, servers, or other computers, telephone lines, and/or a combination of these and other familiar or yet-to-be-invented technologies for transmitting digital content. The illustrated configured storage medium 1110 is described in detail elsewhere herein.

FIG. 12 illustrates one of many possible embodiments of the broker 504; for completeness, FIG. 12 illustrates features that are not required in every embodiment.

In the illustrated embodiment, the broker 504 includes one or more goods servers 1200 and one or more sample servers 1202. Goods and samples are separated in this implementation for increased security, but may be combined in other embodiments, for faster response, increased ease of maintenance, or lower cost, for instance.

The servers may be implemented using physically separate (but networked) machines, or using logically separate server processes running on the same underlying computer hardware. In the case of separate machines, network connections 1204, 1216 permit communication between the machines. Suitable network connections include those known in the art.

An optional access control module 1206 controls access by the parties to a transaction (and by other entities) to a storage 1208 which contains escrowed digital goods. Operating system, file system, distributed directory, public key infrastructure, firewall, and/or other familiar access controls may be used to implement the access control module 1206. The storage 1208 may be implemented using disks, RAID systems, and/or other computer data storage media and devices.

An optional accounting/logging module 1210 performs accounting and/or logging operations. Logging uses familiar

activity logging technology to maintain a log of the accesses granted or denied by the access control module 1206, the source and date on which goods were escrowed into the store 1208, transfers of digital content samples from the goods server 1200 to the sample server 1202, and/or other activity. The logs may be kept for enhanced security, to assist testing or debugging of the broker 504 software and/or hardware, or for other reasons. For instance, the logs may be used by accounting routines in the module 1210 to charge parties for escrow services, transactional activity, and/or sampling performed by the broker 504 for those parties.

An optional cataloging module 1212 creates catalogs, using novel samples according to the present invention. The catalogs may also contain conventional descriptions and samples of digital and/or non-digital goods, or services. Catalogs may take the form of one or more web pages (possibly with associated images and/or sounds), PDF or other integrated text-and-image files, multi-media presentations, or other formats for presenting digital content to prospects for purchase or a barter exchange.

An optional sampling module 1214 creates samples 1222 of digital content as discussed herein. The source digital content may be read from escrowed digital goods in the store 1208. Samples 1222 may also be created 902 "on-the-fly" by reading source content over the network connection(s) 1106, 1108, processing it (e.g., by 1004 distortion), and providing the resulting sample 1222 as output without escrowing the sampled goods.

In the illustrated embodiment, an optional sample manager 1218 stores and retrieves samples 1222 from a sample store 1220. The sample manager 1218 may also include access control, accounting, logging, and/or cataloging routines. The storage 1220 may be implemented using RAM, disks, RAID systems, and/or other computer data storage media and devices.

An optional transaction manager 1224 tracks the state and progress of a transaction. In some embodiments, the transaction is a goods-for-payment transaction of the types illustrated in one or more of FIGS. 5-7 and notation examples T4Q, T4Q', T5Q, T6Q, T7. In some embodiments, the transaction is a goods-for-goods barter transaction of the type illustrated in FIG. 8. In either case, the transaction manager 1224 includes routines and supporting hardware for steps such as authenticating parties, receiving and escrowing goods, obtaining and providing samples, obtaining and providing catalogs, receiving approvals and/or noting implicit approval by lack of cancellation after a specified time, releasing payments and/or goods to complete a transaction, and billing parties for services rendered. Which steps are present depends on the embodiment in question.

An authentication module 1226 and a network connection 1228 may also be present, to provide buyers with controlled access to samples 1222 from the sample store 1220. These modules may be implemented using the same or similar tools and techniques as those in the access control 1206 and other network connection 1204, 1216 components, respectively.

#### Conclusion

The invention provides methods, systems, and other embodiments for facilitating transactions involving digital content. Tools and techniques are provided for addressing various trust issues. Some of these issues are common to a wide variety of transactions, while other trust issues arise with particular strength in transactions that involve digital goods.

To address such issues, in some methods of the invention a seller 500 makes a copy of its digital content accessible to

an automatic broker tool 504, which creates 902 a sample of the digital content. The sample's content is not predicted by the seller, so a buyer 502 can rely on the accuracy of the sample as an indicator of the nature and characteristics of the goods. The sample provides useful information about the digital content without giving the buyer 502 a complete and accurate copy of the digital content, so the seller 500 can make information about the goods available to the buyer 502 without thereby increasing the risk of unauthorized use of the goods.

The sample may be created 902 by distorting at least a portion of the digital content, by burdening at least a portion of the digital content with spurious data, by extracting a portion of the digital content and thereby omitting the remaining portion of the digital content, or by some combination of these steps. Authentication information may be placed in the sample as part of a burdening step 1006, thereby permitting authentication which verifies that the automatic broker tool 504 is the source of the sample. The sampling technique may be selected by the automatic broker tool 504 in response to an identification (by the tool or by a user) of the data type of the digital content, e.g., "prose text" or "Microsoft Excel Database". The sample may be provided to the buyer 502 for inspection, may be provided to the seller 500, and/or may be placed in a catalog 904 of the seller.

In addition to providing samples, the automatic broker tool 504 may track the state of a transaction, accept goods for escrow 506, 800, note approvals 808, 810, release payments 510, and/or release goods 514, 812, 814. In completing a transaction, for instance, the broker 504 may release a copy of the digital content to at least one of the buyer 502 and an agent for the buyer, and may release a payment from the buyer to at least one of the seller 500 and an agent for the seller.

In some embodiments, an automatic broker tool 504 for facilitating transactions involving digital content includes a goods store 1208 for storing digital goods escrowed with the automatic broker tool, a sampling means (e.g., software/hardware implementing one or more of the steps 1002, 1004, 1006) in a module 1214 for creating a sample of digital goods, and a processor in a computer 1104 operable in connection with a configured memory of that computer to provide samples created by the sampling means and to escrow digital goods in the goods store. In one embodiment, the processor is also operable in connection with the configured memory to complete transactions by releasing 514 escrowed digital goods to a first party and releasing 512 a corresponding payment to a second party. In one embodiment, the processor is also operable in connection with the configured memory to complete transactions by releasing 814 escrowed digital goods of a first party to a second party and releasing 812 escrowed digital goods of the second party to the first party.

In some embodiments, an automatic broker tool 504 for facilitating barter transactions involving digital content includes the escrowed goods store 1208, and the digital goods are provided by at least two parties. The computer 1104 processor is operable in connection with the configured memory to escrow digital goods for the parties in the goods store 1208, to receive 808, 810 goods release approvals from the parties, and in response to those release approvals to complete a barter transaction by releasing 812, 814 escrowed goods to parties other than the parties that provided them to be escrowed. The broker may include a distorting sampling means for creating a sample by distorting 1004 a copy of at least a portion of the digital goods,

such as by changing the order of data in the digital content. The broker may include a burdening sampling means for creating a sample by adding data to a copy of at least a portion of the digital goods, such as by adding steganographic data and/or spurious data to a copy of at least a portion of the digital goods.

A sample 1222 may be provided in the store 1220, from sampling module 1214 or as the result of a step 902. The sample 1222 of digital content may be produced according to the invention by a process for facilitating a transaction involving digital content possessed by a party (500, 502, or otherwise), the process comprising the steps of the party making a copy of the digital content accessible to an automatic broker tool 504, and the automatic broker tool creating 902 a sample of the digital content. The sample is characterized in that its content is not predicted by the party, whereby the sample contains useful information about the digital content without containing a complete and accurate copy of the digital content.

Some embodiments include a configured computer storage medium 1110 which will cause at least a portion of a computer system 1100, 1102, and/or 1104 to perform method steps for facilitating transactions involving digital content provided by a party, the method comprising the party making a copy of the digital content accessible to an automatic broker tool 504, and the automatic broker tool creating a sample 1222 of the digital content, the sample's content not predicted by the party as discussed above. In one method the party escrows the digital content with the automatic broker tool. In one method the broker creates the sample by distorting at least a portion of the digital content. In one method the broker creates the sample by burdening at least a portion of the digital content with spurious data.

Some configured computer storage medium 1110 embodiments will cause at least a portion of a computer system 1104 to perform method steps for facilitating barter transactions involving digital content, by receiving from a first party a copy of first digital content and escrowing that first digital content; receiving from a second party a copy of second digital content and escrowing that second digital content; determining an approval exists to release the first digital content to the second party; determining an approval exists to release the second digital content to the first party; releasing the first digital content to the second party; and releasing the second digital content to the first party.

Some configured computer storage medium 1110 embodiments will cause at least a portion of a computer system 1100, 1102, 1104 to perform method steps for facilitating transactions involving digital content, the digital content provided by a seller 500, by receiving from the seller a copy of digital content and escrowing that digital content, and creating 902 a sample of the digital content, including at least one of distorting a copy of at least a portion of the digital content and adding spurious data to a copy of at least a portion of the digital content. The sample creating step may place authentication information in the sample, thereby permitting authentication which verifies the source(s) of the sample.

In connection with a method for facilitating barter transactions using an automatic broker tool 504, one method of the invention includes the steps of obtaining a description of the automatic broker tool and employing the description by advertising at least one of the automatic broker tool and a barter transaction service which uses the automated broker tool. Similarly, in connection with a method for using sampling 902 to facilitate digital content transactions, another method of the invention includes the steps of

obtaining a description of a configured computer storage medium 1110 and employing the description by advertising at least one of a configured computer storage medium and a service which uses the configured computer storage medium.

Although particular embodiments of the present invention are expressly illustrated and described individually herein, it will be appreciated that discussion of one type of embodiment also extends to other embodiment types. For instance, the description of the methods illustrated in FIGS. 5 through 10 also helps describe the systems and devices in FIGS. 11 and 12, and vice versa.

As used herein, terms such as "a" and "the" and designations such as "device", "item", and "step" are inclusive of one or more of the indicated element. In particular, in the claims a reference to an element generally means at least one such element is required.

The invention may be embodied in other specific forms without departing from its essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. Headings are for convenience only. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

What is claimed and desired to be secured by patent is:

1. A method for facilitating transactions involving digital content, the digital content provided by a seller, the method comprising the steps of:

the seller making a copy of the digital content for a transaction accessible to an automatic broker tool; and the automatic broker tool creating a sample of the digital content, the sample characterized in that its content is not predicted by the seller, whereby the sample contains useful information about the digital content without containing a complete and accurate copy of the digital content, thereby preventing an unauthorized use of the digital content.

2. The method of claim 1, wherein the broker creates the sample by distorting at least a portion of the digital content.

3. The method of claim 1, wherein the broker creates the sample by burdening at least a portion of the digital content with spurious data.

4. The method of claim 1, wherein the broker creates the sample by extracting a portion of the digital content and thereby omitting the remaining portion of the digital content.

5. The method of claim 1, further comprising the step of placing the sample in a catalog of the seller.

6. The method of claim 1, further comprising the step of the automatic broker tool providing the sample to the seller.

7. The method of claim 1, further comprising the step of the automatic broker tool providing the sample to a buyer for inspection.

8. The method of claim 7, further comprising the step of the automatic broker tool completing a transaction, the completing step comprising releasing a copy of the digital content to at least one of the buyer and an agent for the buyer.

9. The method of claim 8, wherein the automatic broker tool also releases a payment from the buyer to at least one of the seller and an agent for the seller while completing the transaction.

10. The method of claim 8, wherein the automatic broker tool also releases digital content from the buyer to the seller while completing the transaction.

11. The method of claim 1, wherein the step of creating a sample comprises placing authentication information in the



sample, thereby permitting authentication which verifies that the automatic broker tool is the source of the sample.

12. The method of claim 1, wherein the automatic broker tool creates a sample using at least one technique which is selected by the automatic broker tool in response to identifying a data type of the digital content.

13. An automatic broker tool for facilitating transactions involving digital content, the tool comprising:

a goods store for storing digital goods escrowed with the automatic broker tool;

a sampling means for creating a sample of digital goods; and

a processor operable in connection with a configured memory to provide samples created by the sampling means and to escrow digital goods in the goods store.

14. The automatic broker tool of claim 13, wherein the processor is also operable in connection with the configured memory to complete transactions by releasing escrowed digital goods to a first party and releasing a corresponding payment to a second party.

15. The automatic broker tool of claim 13, wherein the processor is also operable in connection with the configured memory to complete transactions by releasing escrowed digital goods of a first party to a second party and releasing escrowed digital goods of the second party to the first party.

16. An automatic broker tool for facilitating barter transactions involving digital content, the tool comprising:

a goods store for storing digital goods to be escrowed, the digital goods provided to the automatic broker tool by at least two parties; and

a processor operable in connection with a configured memory to automatically escrow digital goods for the parties in the goods store, to receive goods release approvals from the parties, and in response to those release approvals to automatically complete a barter transaction by releasing escrowed goods to parties other than the parties that provided them to be escrowed.

17. The automatic broker tool of claim 16, further comprising a distorting sampling means for creating a sample by distorting a copy of at least a portion of the digital goods.

18. The automatic broker tool of claim 17, wherein the distorting sampling means changes the order of data in the digital content.

19. The automatic broker tool of claim 16, further comprising a burdening sampling means for creating a sample by adding data to a copy of at least a portion of the digital goods.

20. The automatic broker tool of claim 19, wherein the burdening sampling means adds steganographic data to a copy of at least a portion of the digital goods.

21. The automatic broker tool of claim 19, wherein the burdening sampling means adds spurious data to a copy of at least a portion of the digital goods.

22. A sample of digital content produced by a process for facilitating a transaction involving digital content possessed by a party, the process comprising the steps of:

the party making a copy of the digital content for a transaction accessible to an automatic broker tool; and the automatic broker tool creating a sample of the digital

content, the sample characterized in that its content is not predicted by the party, whereby the sample contains useful information about the digital content without containing a complete and accurate copy of the digital content, thereby preventing an unauthorized use of the digital content.

23. A configured computer storage medium which will cause at least a portion of a computer system to perform method steps for facilitating transactions involving digital content, the digital content provided by a party, the method comprising the steps of:

the party making a copy of the digital content for a transaction accessible to an automatic broker tool; and the automatic broker tool creating a sample of the digital content, the sample characterized in that its content is not predicted by the party, whereby the sample contains useful information about the digital content without containing a complete and accurate copy of the digital content, thereby preventing an unauthorized use of the digital content.

24. The configured computer storage medium of claim 23, wherein the method further comprises the step of the party escrowing the digital content with the automatic broker tool.

25. The configured computer storage medium of claim 23, wherein the broker creates the sample by distorting at least a portion of the digital content.

26. The configured computer storage medium of claim 23, wherein the broker creates the sample by burdening at least a portion of the digital content with spurious data.

27. A configured computer storage medium which will cause at least a portion of a computer system to perform method steps for facilitating barter transactions involving digital content, the digital content provided by at least two parties, the method comprising the computer-implemented steps of:

receiving from a first party a copy of first digital content and escrowing that first digital content;

receiving from a second party a copy of second digital content and escrowing that second digital content;

determining an approval exists to release the first digital content to the second party;

determining an approval exists to release the second digital content to the first party;

releasing the first digital content to the second party; and

releasing the second digital content to the first party.

28. The configured computer storage medium of claim 27, wherein at least one of the determining steps comprises receiving an approval from the party that provided the digital content being approved for release.

29. The configured computer storage medium of claim 27, wherein at least one of the determining steps comprises timing out after no cancellation is received from the party that provided the digital content being approved for release.

30. The configured computer storage medium of claim 27, wherein the method further comprises the steps of creating a sample of digital content; and sending the sample to at least one of the parties prior to at least one of the determining steps.

31. The configured computer storage medium of claim 27, wherein the digital content includes an image and the step of creating a sample creates a thumbnail of the image.

32. A configured computer storage medium which will cause at least a portion of a computer system to perform method steps for facilitating transactions involving digital content, the digital content provided by a seller, the method comprising the steps of:

receiving from the seller a copy of digital content and escrowing that digital content; and

creating a sample of the digital content, including at least one of distorting a copy of at least a portion of the digital content and adding spurious data to a copy of at least a portion of the digital content.

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33. The configured computer storage medium of claim 32, wherein the sample creating step further comprises placing authentication information in the sample, thereby permitting authentication which verifies the source of the sample.

34. A method for facilitating barter transactions involving digital content using an automatic broker tool for facilitating barter transactions involving digital content, the tool comprising a goods store for storing digital goods to be escrowed, the digital goods provided to the automatic broker tool by at least two parties, the tool further comprising a processor operable in connection with a configured memory to escrow digital goods for the parties in the goods store, to receive goods release approvals from the parties, and in response to those release approvals to release escrowed goods to parties other than the parties that provided them to be escrowed, the method comprising the steps of obtaining a description of the automatic broker tool and employing the description by advertising at least one of the automatic broker tool and a barter transaction service which uses the automated broker tool.

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35. A method for facilitating transactions involving digital content, the method comprising the steps of obtaining a description of a configured computer storage medium and employing the description by advertising at least one of a configured computer storage medium and a service which uses the configured computer storage medium, the computer storage medium configured to cause at least a portion of a computer system to perform steps in a process, the digital content provided by a party, the process comprising the party making a copy of the digital content for a transaction accessible to an automatic broker tool, the process further comprising the automatic broker tool creating a sample of the digital content, the sample characterized in that its content is not predicted by the party, whereby the sample contains useful information about the digital content without containing a complete and accurate copy of the digital content, thereby preventing an unauthorized use of the digital content.

\* \* \* \* \*





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# United States Patent [19]

Logan et al.

[11] Patent Number: 5,781,909

[45] Date of Patent: Jul. 14, 1998

[54] SUPERVISED SATELLITE KIOSK  
MANAGEMENT SYSTEM WITH COMBINED  
LOCAL AND REMOTE DATA STORAGE

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[21] Appl. No.: 600,910

[22] Filed: Feb. 13, 1996

[51] Int. CL<sup>6</sup> ..... G06F 17/30

[52] U.S. Cl. .... 707/200; 395/200.3

[58] Field of Search ..... 395/601, 602,  
395/603, 604, 605, 606, 611, 612, 613,  
614, 615, 616; 707/1, 2, 3, 4, 5, 6, 100,  
101, 102, 103, 104, 200

## [56] References Cited

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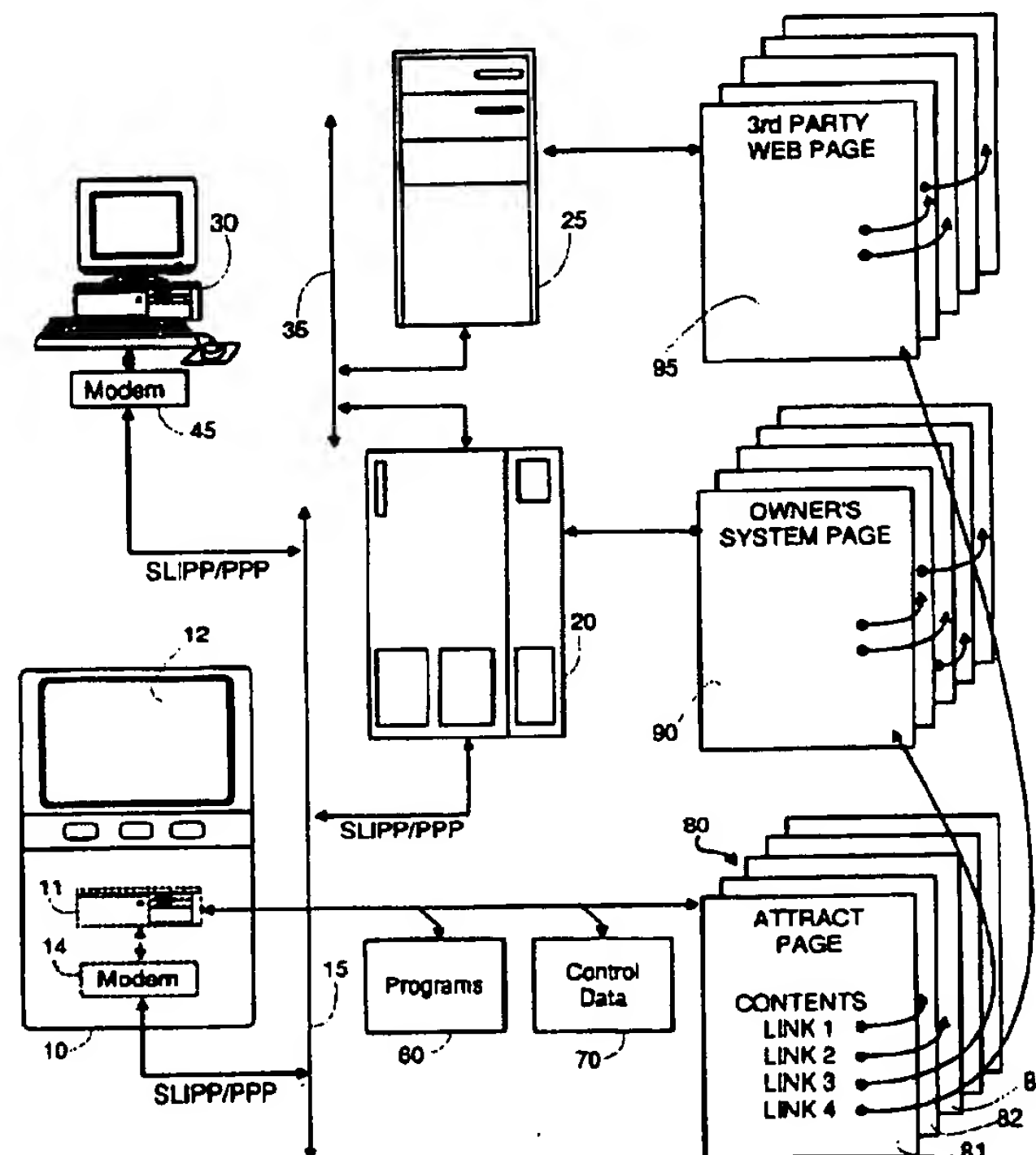
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Primary Examiner—Thomas G. Black  
Assistant Examiner—Ruay Lian Ho  
Attorney, Agent, or Firm—Banner & Witcoff, Ltd

## [57] ABSTRACT

A network based hypertext display system employing a supervisory computer interconnected with one or more information display units and one or more remote document servers via a network, such as the Internet. The supervisory computer controls the content displayed by the display units by transferring to each unit a control information file as well as hypertext document files which are locally stored in the display units. The control file determines the extent to which the display unit can access remotely stored information and provides additional information which is used to alter the presentation to the user. Stored control information is used to rewrite hypertext document such that certain links are disabled, and to suppress the appearance of visual cues associated with the displayed anchor which identifies selected links in the referencing document. Links and other information in local and remotely accessed documents are rewritten in accordance with commands created by a content developer using an interactive content authoring system. Means are employed for controlling the duration of a given user session in response to the material selected for display, the time of day, and user demographics. Locally stored data copied from original documents stored on remote servers is periodically validated and updated when the validation indicates that the original has been modified.

18 Claims, 12 Drawing Sheets



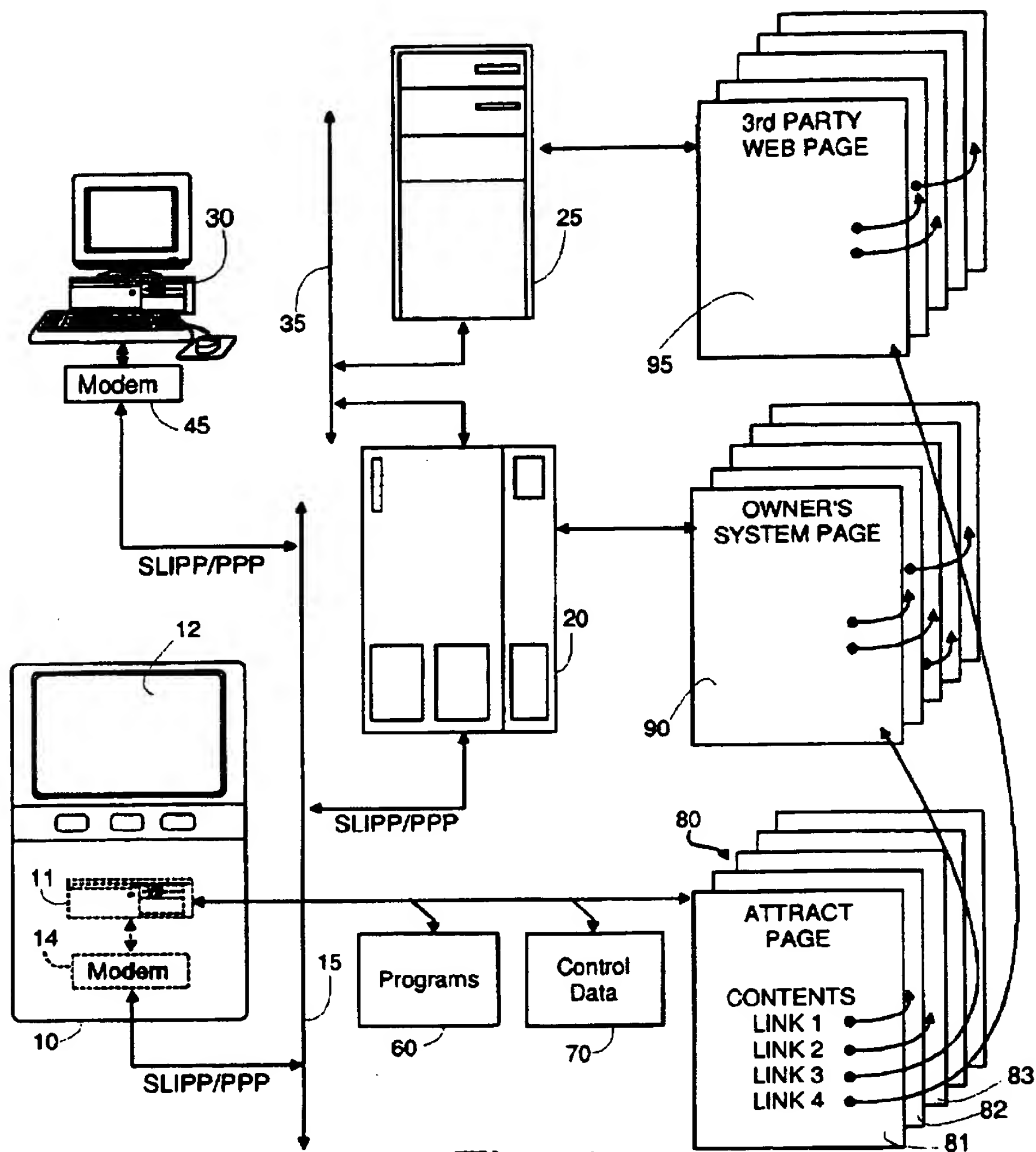


Fig. 1

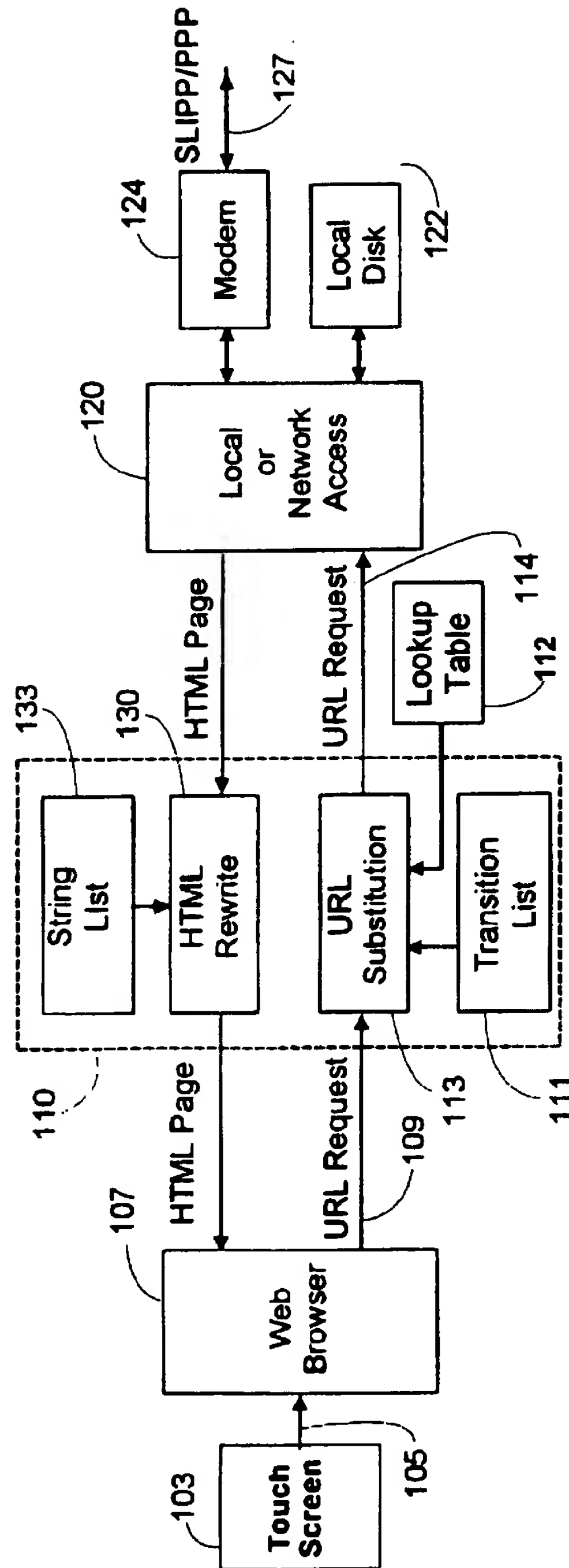
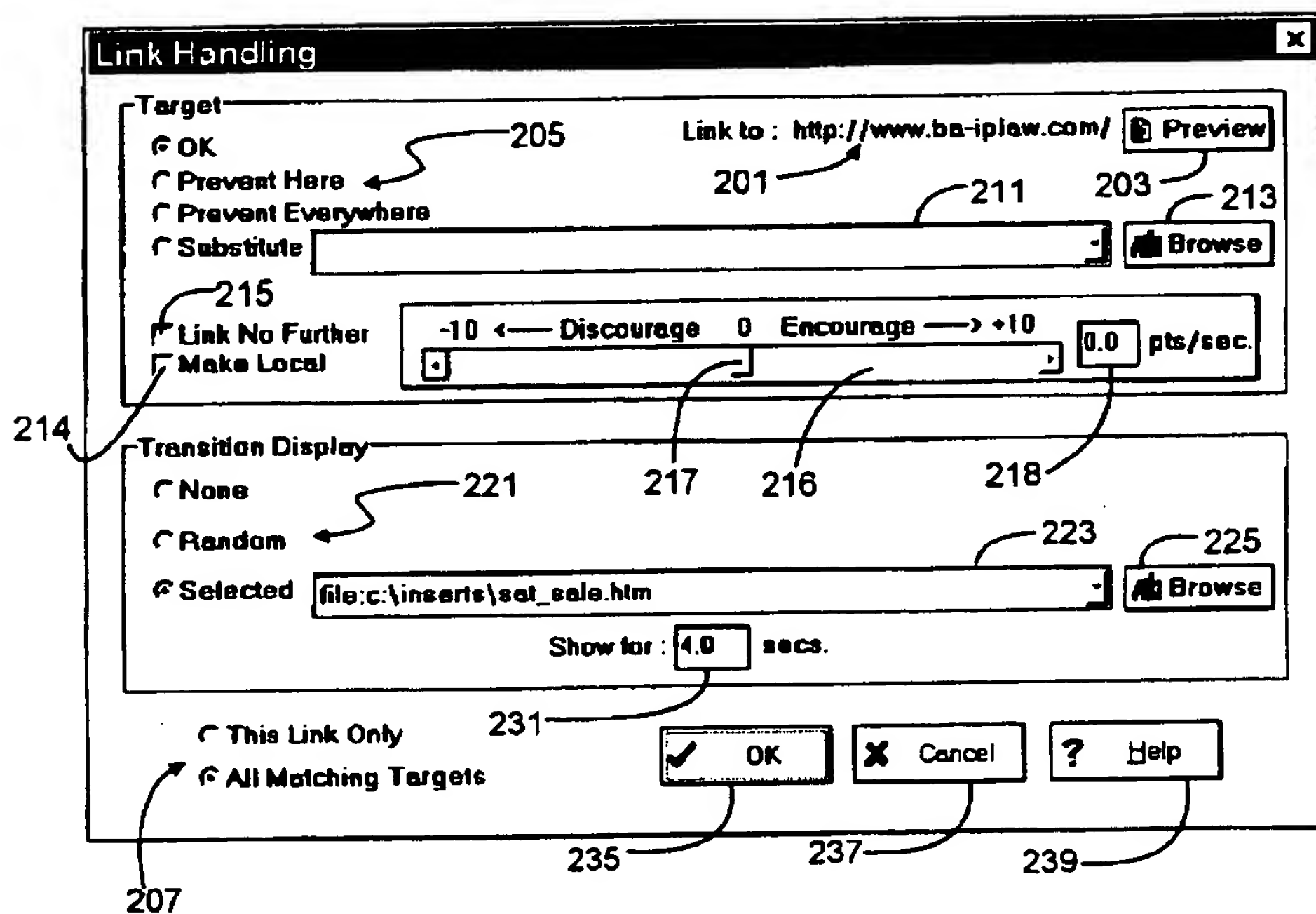
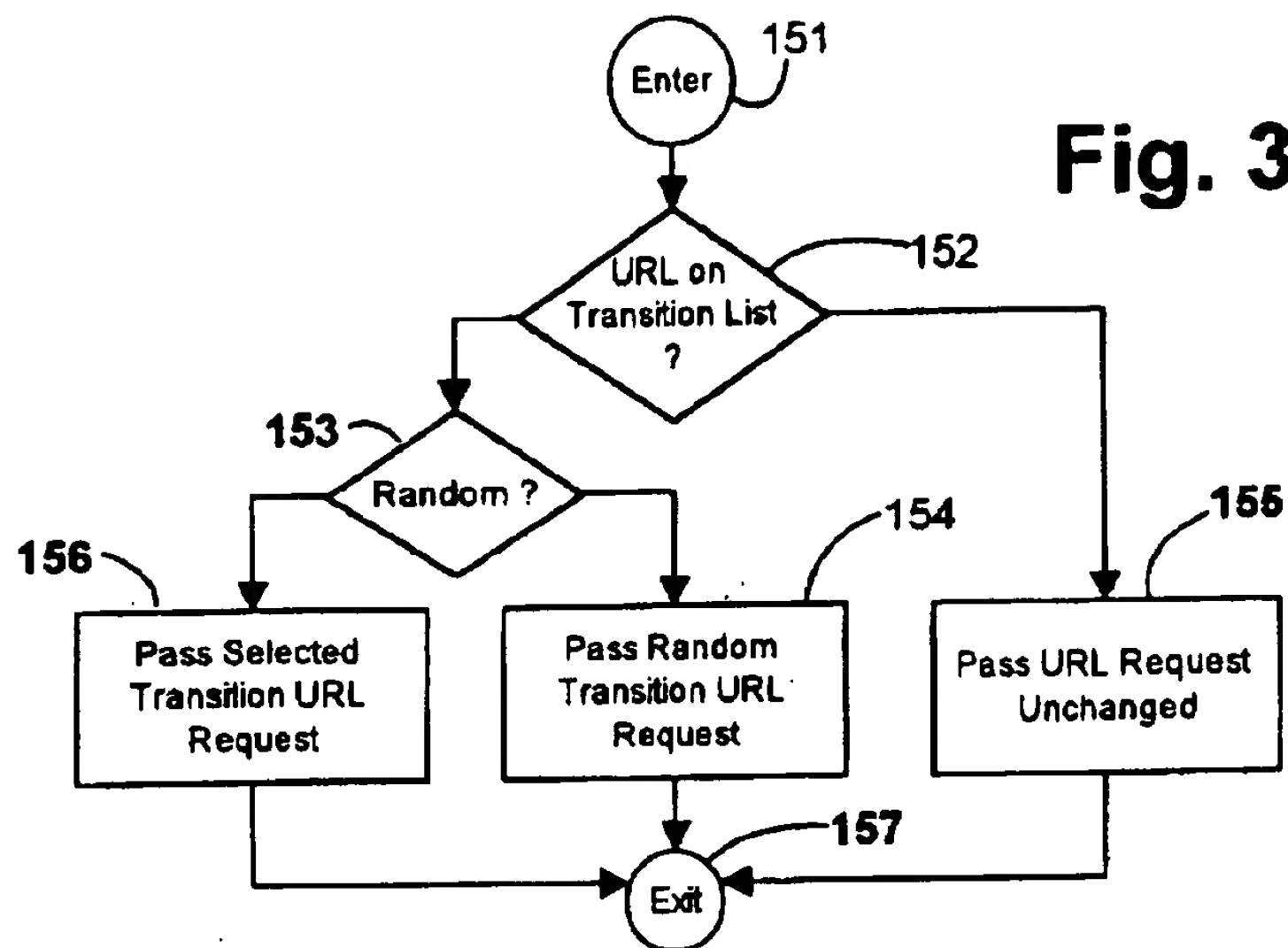


Fig. 2

**Fig. 4**

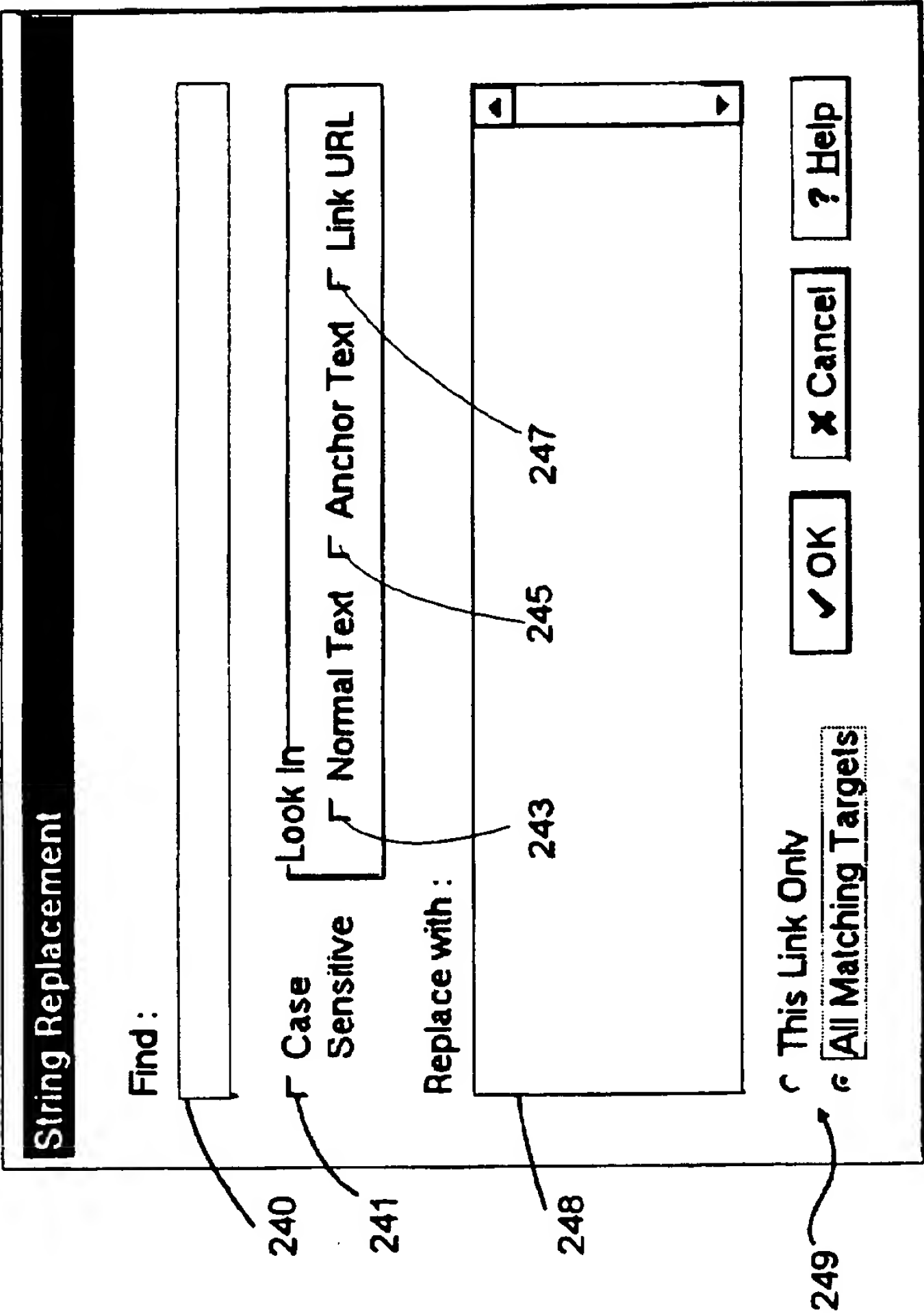


Fig. 5

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**Link Description**

**Anchor Text :**  
 Visible, highlighted anchor text of arbitrary length is entered in this memo box and may be cut and copied from another running application. When this dialog box is activated when text on the current HTML page is selected, the selected text appears here as the default.

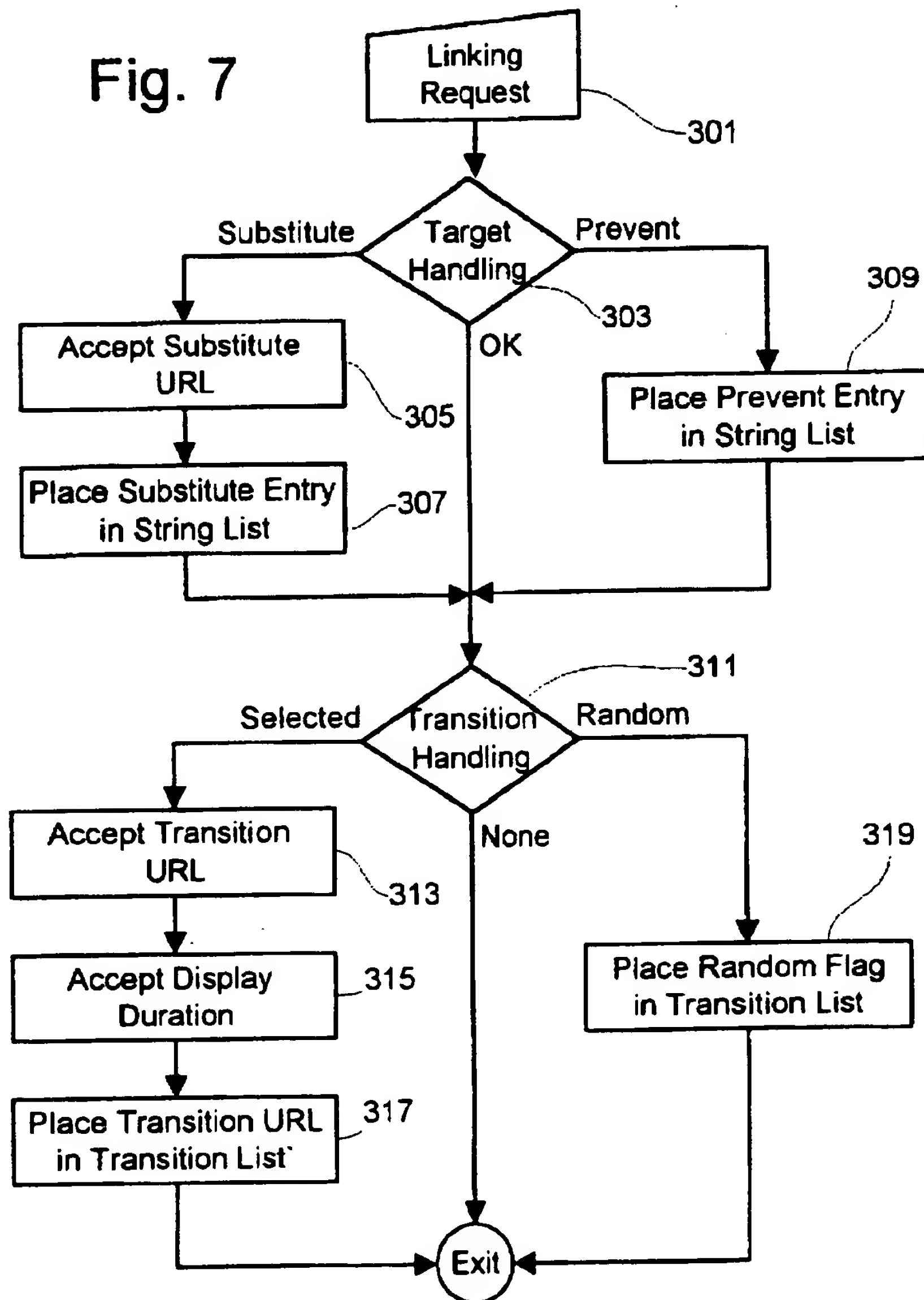
**Anchor Image :**

**Link To :**

253 257 261 263 265 267

Fig. 6

Fig. 7



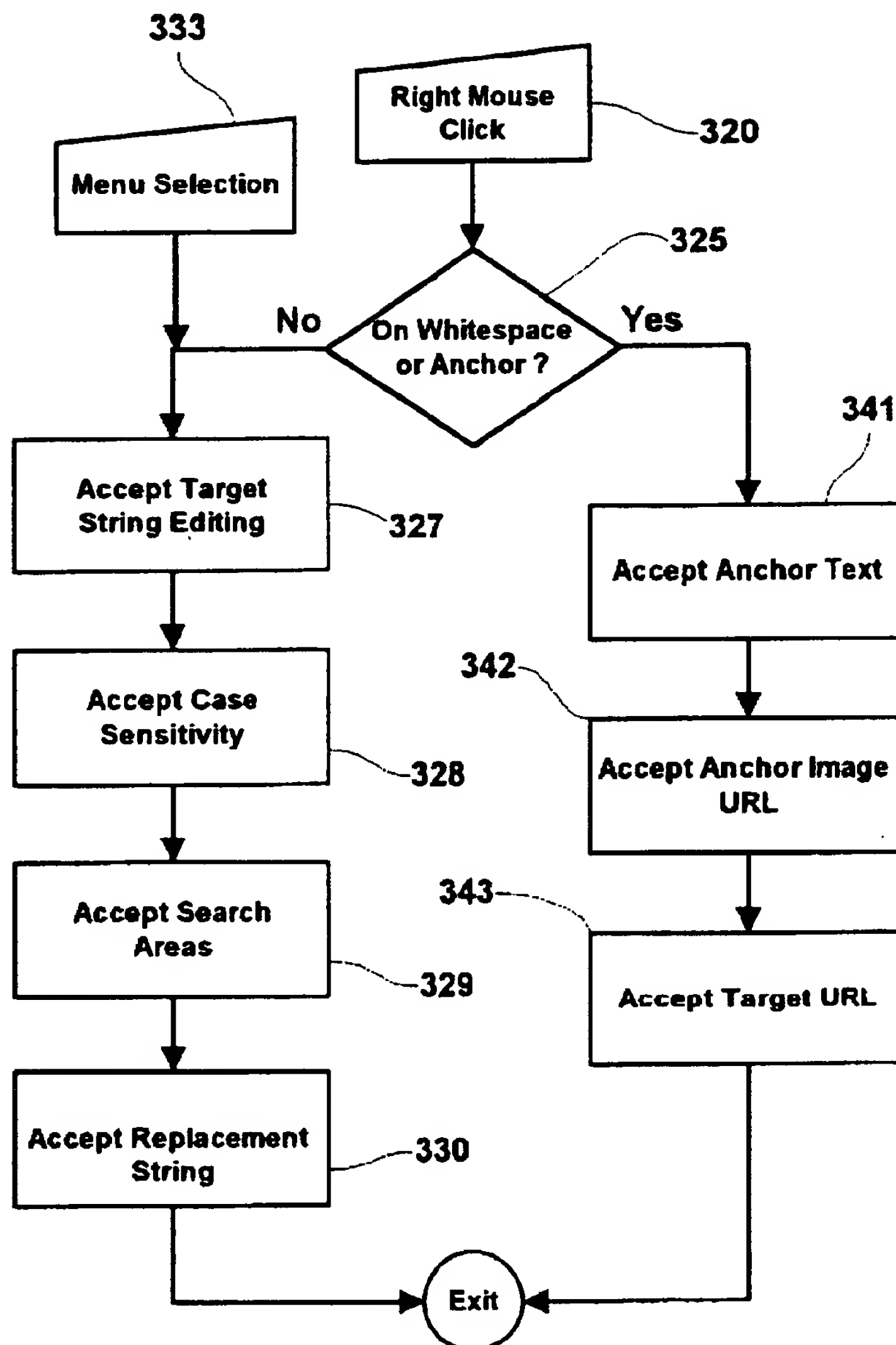
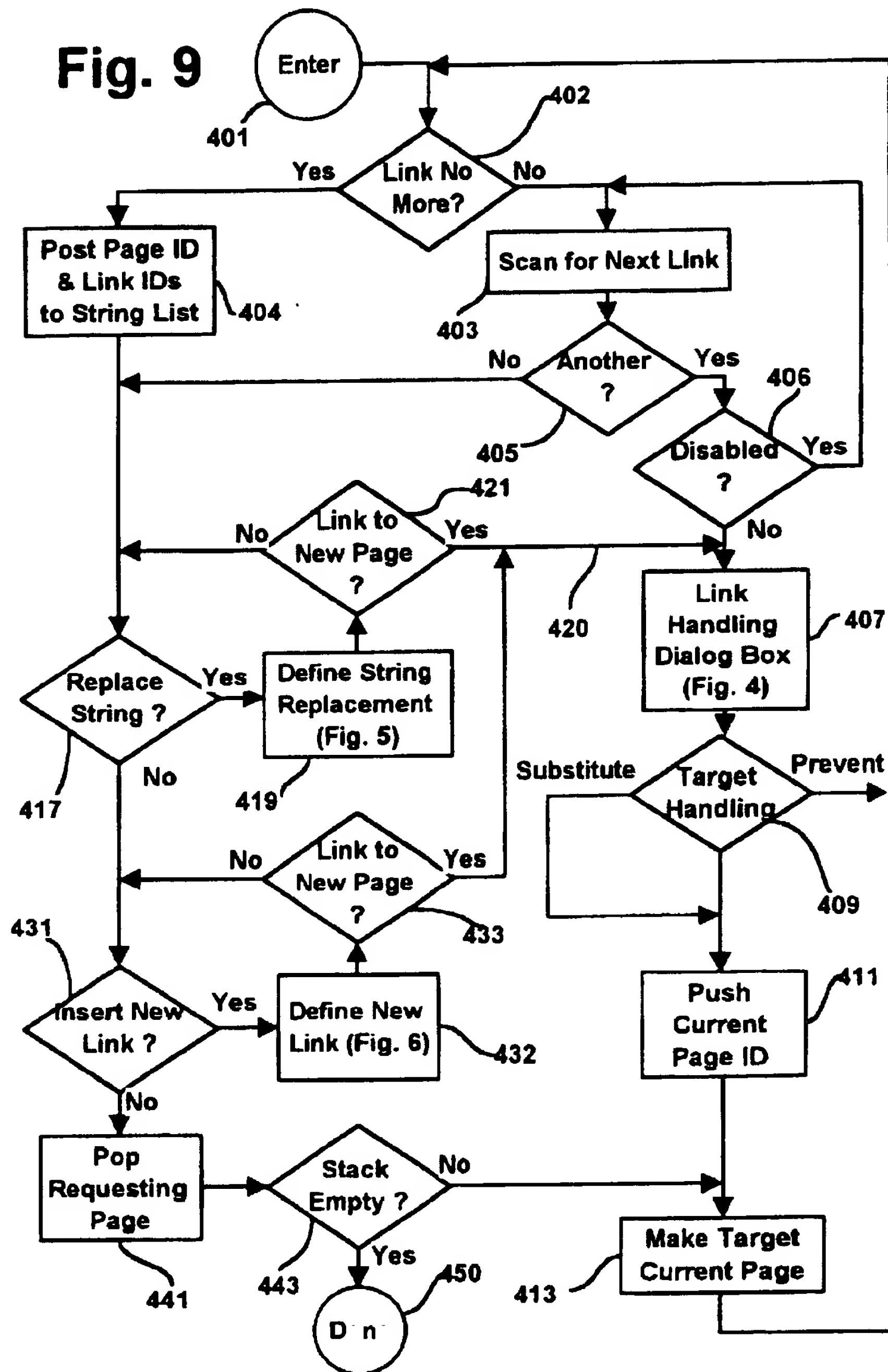


Fig. 8



Fig. 9



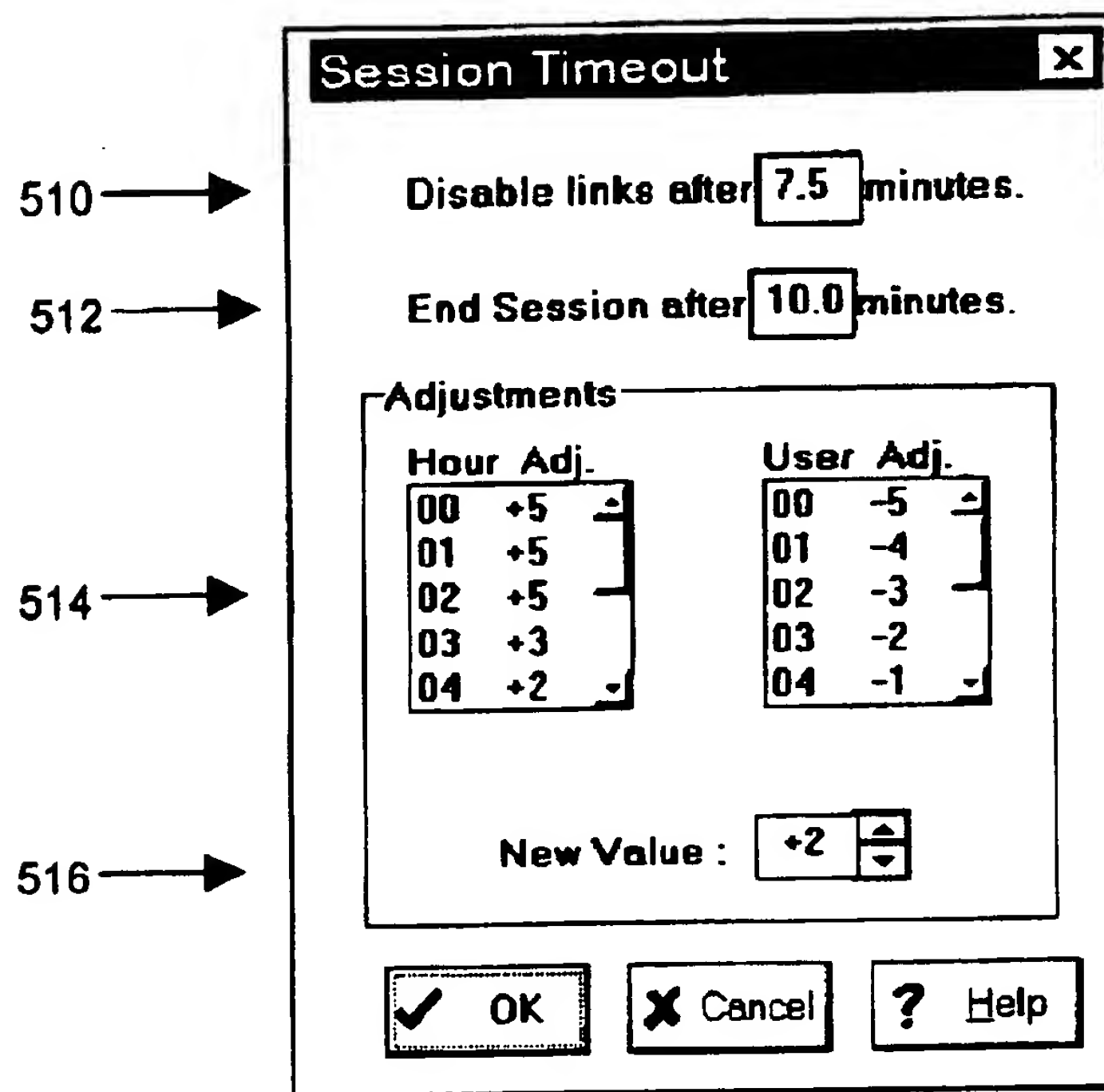


Fig. 10

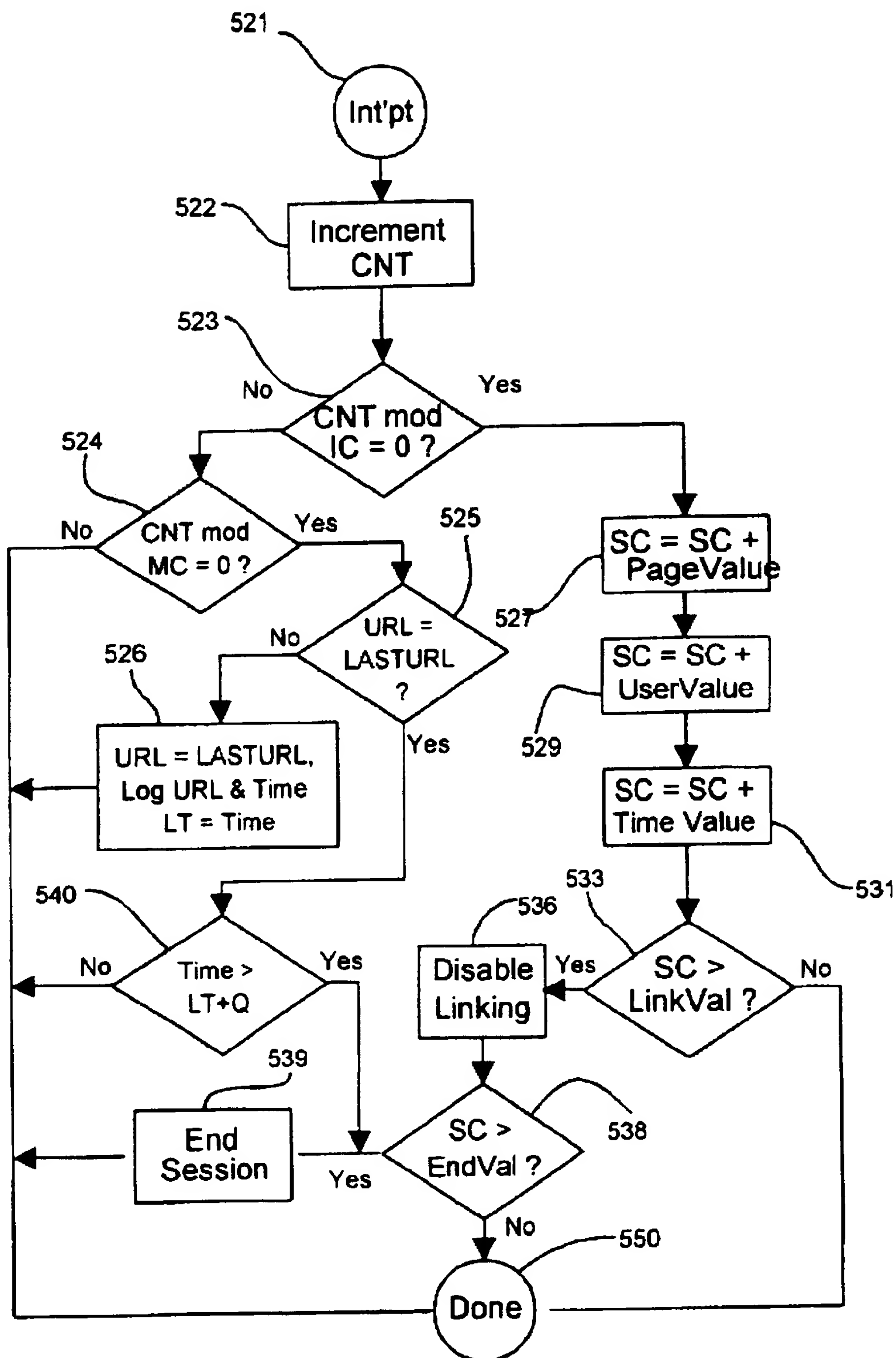


Fig. 11

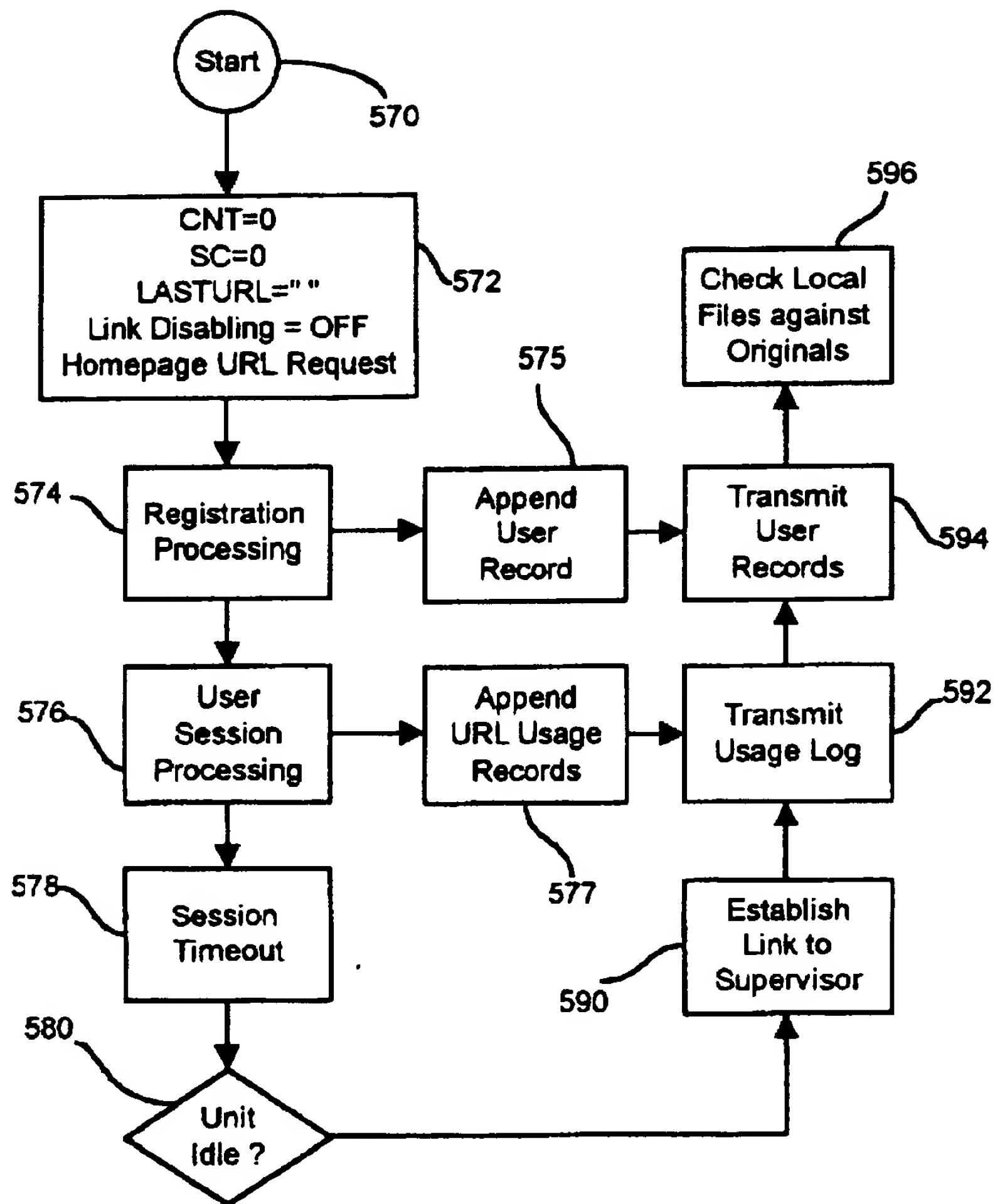
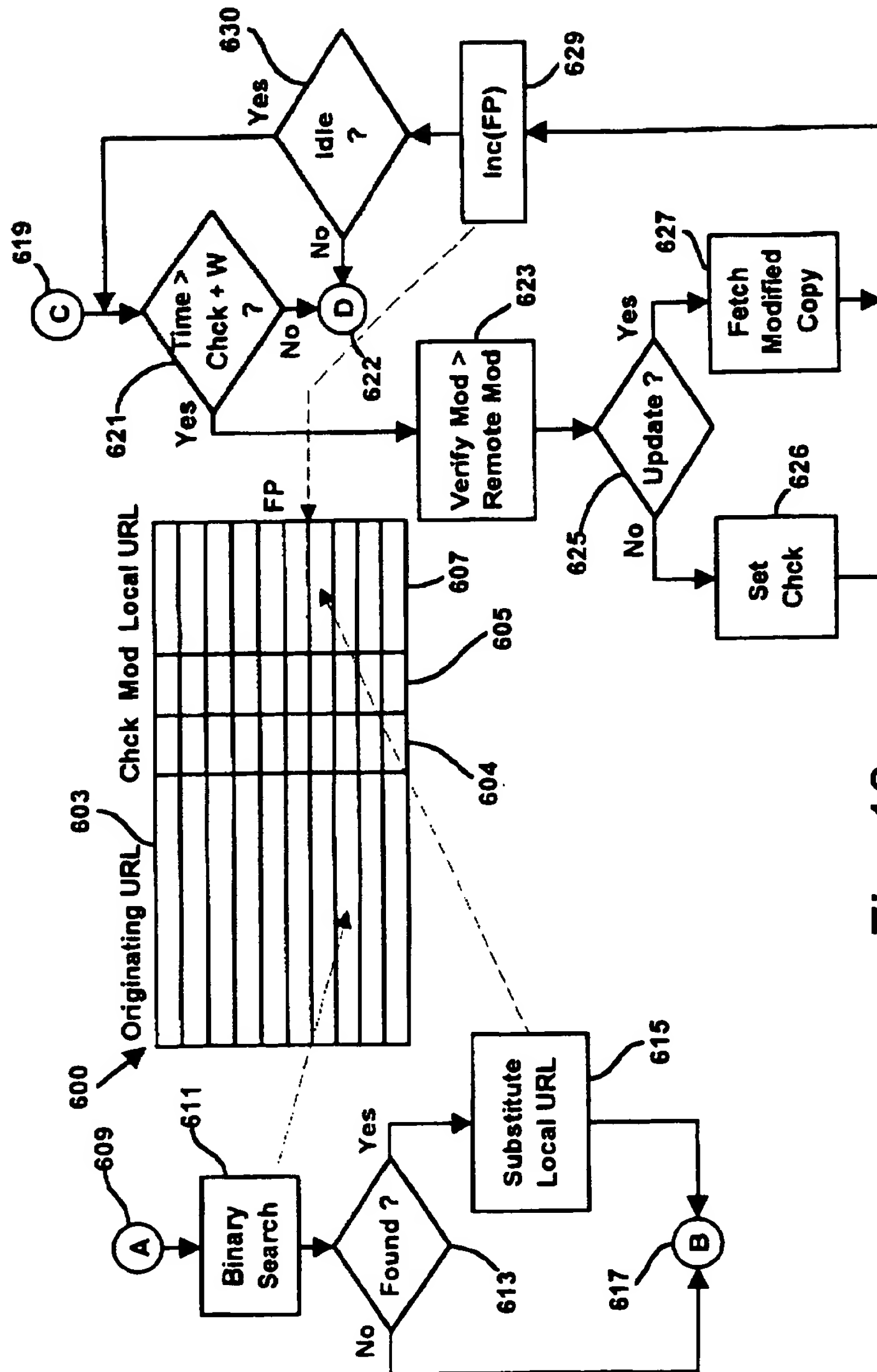


Fig. 12



**Fig. 13**

# **SUPERVISED SATELLITE KIOSK MANAGEMENT SYSTEM WITH COMBINED LOCAL AND REMOTE DATA STORAGE**

## **FIELD OF THE INVENTION**

This invention relates to electronic information display systems and more particularly to network based information display system for displaying hypertext documents.

## **BACKGROUND OF THE INVENTION**

Kiosks equipped with touchscreens have proven to be a highly effective means for conveying useful information to the public. In retail stores, for example, kiosks can provide directory information to help customers find needed products while promoting featured items. Placed in corporate lobbies, showrooms or trade show booths, the kiosk can be an effective sales tool, allowing the user to select text and graphical information of particular interest. In malls, airport lobbies, community information centers, and other public areas, the kiosk can effectively answer questions, guide visitors to desired locations, and publicize the products and services offered by the kiosk's sponsors.

Because kiosks can be readily implemented with inexpensive personal computers and touchscreen monitors, the principal cost of a typical kiosk-based information system is incurred in designing and implementing the software which generates the desired interactive displays. This expense typically grows as the displays are continually altered to reflect new information.

Interactive displays which are closely similar in style and content to those needed for kiosk systems are now being created in large quantities by businesses seeking the exposure offered by the World Wide Web, the Internet system of interlinked hypertext documents. Businesses, institutions and individuals are presenting a rapidly increasing volume of promotional, tutorial, entertainment, and reference information on interactive "web pages made" and available to any computer having standard web browsing software and an Internet service connection.

## **SUMMARY OF THE INVENTION**

It is an object of the present invention to facilitate the programming, monitoring and control of one or more information display units which are remotely located from a supervisory computer which provides the content for and monitors the operation of the display units over telecommunication pathways.

In accordance with the invention, each information display unit is provided with its own processor and display screen which preferably takes the form of a touch screen capable of accepting selections from a user, as well as local storage means for persistently storing programs, hypertext documents to be displayed, and control information. Each such display unit is further provided with communications facilities which provide a file transfer pathway to a remote supervisory computer which, along with other server computers made available by the communications facilities, may remotely store displayable information in the form of hypertext documents, executable applets, imbedded image data, and related files. Control processing means executing on display unit processor responds to user selections to access displayable documents stored on both the local storage means and provided via the communications facility from one or more identified remote servers.

As contemplated by the invention, a control information file transferred from a supervisory computer to each display

unit identifies those documents which are locally stored copies of original documents stored in remote servers, together with the record location identifier for those original documents. The display unit processor further comprises request processing means for redirecting display requests which identify such remotely stored documents such that the request is satisfied by the locally stored copy. Validation means, operating either at the supervisory computer or at the display unit, verify the integrity of the locally stored copies by comparing attributes of those stored copies against data describing the originals retrieved from the supervisory computer or remote servers, and performs a transfer of modified information from the remote location into local storage whenever the validation comparison indicates a need to update the stored data. The validation means preferably comprises means for cyclically scanning the entries in the control information file to identify locally stored files and the locations of their remote counterparts, together with entries indicating the time when the locally stored file was created and the time when the locally stored file was last validated, and means responsive to idle conditions at the display terminal for performing validation testing and update transfers when the display terminal is not in use.

As further contemplated by the invention, each display unit includes means for forming a record of the information requested by users at each display unit and for transferring this record from the display unit to the supervisory processor. Each entry in the record preferably identifies a particular document displayed, the time when that particular document was displayed, and the identity of the user.

As further contemplated by the invention, the information to which each display unit permitted access is defined by the combination of the locally stored data and access control information which is transferred to the display unit from an authoring station to control the content made available at the display unit.

These and other objects and features of the invention will become more apparent through a consideration of the following detailed description of a preferred embodiment of the invention. In the course of this description, frequent reference will be made to the attached drawings.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a illustration of the principal components used to implement a programmable, interactive HTML display kiosk system embodying the invention;

FIG. 2 is a block diagram of the principal components of a controlled access HTML display system employed to implement an embodiment of the kiosk unit employing the invention;

FIG. 3 is a flow chart illustrating the operation of the transition display mechanism used in the kiosk unit;

FIG. 4 depicts the on-screen appearance of a dialog box used to interactively obtain information for controlling the operation of hypertext links found in HTML pages;

FIG. 5 shows the on-screen appearance of a dialog box used to obtain information defining the manner in which text information found in an HTML document is automatically rewritten to implement the invention;

FIG. 6 illustrates the on-screen appearance of a dialog box employed to interactively obtain control information which defines or redefines links appearing in displayed hypertext documents;

FIG. 7 is a flow chart which illustrates the manner in which information supplied by the dialog box of FIG. 4 is utilized by the invention; and



FIG. 8 is a flow chart which depicts a routine for utilizing information supplied by means of the dialog boxes of FIGS. 5 and 6;

FIG. 9 is a flow chart illustrating a mechanism for automating a content development session during which the information which may be accessed by a kiosk user is defined;

FIG. 10 shows the on-screen appearance of a dialog box used to accept information defining the manner in which the duration of an individual user session is limited based upon the character of the documents selected for viewing, the time of day, and information characterizing the particular user;

FIG. 11 is a flow chart describing a routine for limiting the duration of a given user session in response to a particular document being viewed and other information provided by the dialog box of FIG. 10 and for recording usage data;

FIG. 12 is a flow chart illustrating the manner in which the display unit exchanges information with an authoring computer which provides its original content, and with a supervisory computer which receives information describing the operation of the display unit; and

FIG. 13 is a flow chart which describes the manner in which the lookup table which relates local storage URL's to the original remote URL of the stored document is used to translate URL requests and to update the stored files periodically to match the originating files.

#### DESCRIPTION OF THE PREFERRED EMBODIMENT

##### System Overview

As seen in FIG. 1, an interactive computer display kiosk 10 which implements the invention consists of a kiosk cabinet within which a personal computer 11 and a touch-screen monitor 12 are mounted. The personal computer 11 is connected via a modem 14 and dial-up or leased telephone lines 15 to a remotely located computer 20 which provides a conventional serial data SLIPP or PPP modem link to the Internet service. The remote computer 20 also operates as a World Wide Web server and is connected via high speed Internet TCP/IP Internet network lines 35 to other computers on the Internet, such as the second web server computer seen at 25. The servers 20 and 25 provide access to stored information to connected client computers such as the kiosk 10 and a personal computer 30 which is also connected via a modem SLIPP/PPP connection over the telephone lines 15 to computer 20. The modem 14 provides data communications via the telephone SLIPP/PPP lines 15 while a modem 45 similarly provides data communications for the personal computer 30.

The personal computer 11 includes its own local magnetic disk drive for persistent mass storage. The computer 30 may be used as an authoring site at which the content accessible by the kiosk computer 11 is defined and from which displayable data and control information may be transferred to the kiosk computer 11. A conventional modem-to-modem connection may be established between the modem 14 attached to kiosk computer 11 and the modem 45 attached to the remote personal computer 30 such that direct file transfers can be made between the computer 30 and the kiosk 10 using a conventional dial-up modem connection via the telephone lines 15. To permit such transfers, the kiosk personal computer 11 may be programmed to place the modem 14 in auto-answer mode when the kiosk 10 is not being used as a web client, enabling the computer 30 to use its modem 45 to directly dial the modem 45 to establish a file transfer connection for storing or modifying programs and

data stored at the kiosk 10. Alternatively, file transfers between the authoring computer 30 and the kiosk computer 11 may be accomplished over the SLIPP/PPP Internet connection using HTTP or FTP file transfers.

As discussed later, computer 11 in kiosk 10 stores hypertext browsing and control programs as indicated at 60, one or more files of access control data as indicated at 70, and locally stored hypertext documents indicated generally at 80 which are displayed on the touchscreen 12 in the kiosk 10. The programs 60, control data files 70, and the displayable hypertext data 80 may be periodically updated from time to time by transferring information from the authoring computer 30 to the kiosk computer 11.

The kiosk programs 60 include conventional web page browsing software such as: the NCSA Mosaic browser available from the National Center for Supercomputing Applications (Software Development Group), Champaign, Ill.; Spyglass Mosaic offered by Spyglass, Inc., Naperville, Ill.; Netscape Navigator marketed by Netscape Communications Corp., Mountain View, Calif.; and Internet Explorer offered by Microsoft Corporation, Redmond, Wash. In general, these web browsers retrieve and display hypertext documents (web pages) written in standard Hypertext Markup Language (HTML).

HTML documents take the form of conventional ASCII text files which include imbedded tags which format the text for display presentation and provide links to graphics files containing images which may be imbedded in the documents, as well as links to other web pages to which hypertext jumps may be made. Linked files and documents are identified within the imbedded tags in a predetermined Uniform Record Locator (URL) format which includes the identification of the communications protocol used (including conventional and secure hypertext protocols respectively, File Transfer Protocol or FTP, etc.), the identification of a particular server computer which stores the referenced file, and the directory and file name of the file itself on the designated server. Hypertext documents and linked files which are stored locally in mass storage and directly accessible by the running browser program may also be designated by a URL and interactively displayed in the same way that the browser displays web pages available from remote servers through the Internet. Extensive information describing HTML, the World Wide Web, and the Hypertext Transport Protocol/Internet Protocol is available in the published literature. See, for example, *World Wide Web Bible* by Bryan Pfaffenberger, MIS:Press, ISBN 1-55828-410-9 (1995); *Netscape and HTML Explorer* by Urban A. LeJeune, Coriolis Group, ISBN 1-883577-57-1 (1995); and *Programming WinSock* by Arthur Dumas, Sams, ISBN 0-672-30594-1 (1994) which describes the WinSock Library, one of several Windows Open Services Architecture (WOSA) standards being used to add TCP/IP connectivity to applications.

As seen in the illustration of FIG. 1, the hypertext documents stored locally on the hard disk of the kiosk computer 11 preferably includes an attract page 81 which, as illustrated, might contain imbedded hypertext links LINK1 AND LINK2 to other locally stored pages 82 and 83 respectively, as well as LINK3 to a home page 90 stored by the web server computer 20, and LINK4 to a further web page 95 stored on the web server computer 25. By touching the touchscreen 82 at the position where highlighted text, or a graphic, which visually represents the linked subject matter appears, the kiosk user can request the display of the linked information, which itself typically contains links to other web pages, and so on.

Using the principles of the invention, the kiosk proprietor may limit the kiosk user's access to authorized pages only. These constraints are provided by access control programs included in the set of programs 60 stored on the hard drive of the kiosk computer 11 which are responsive to information stored in the control data files 70 also stored in computer 11. The access control programs analyze and rewrite the text found in accessed HTML pages before those pages are displayed and perform predetermined functions defined by stored access control information when the user activates selected links.

The access control information itself may be conveniently created using the remote authoring computer 30 by browsing a combination of locally stored hypertext documents and remote web pages while responding appropriately to requests for access control information which is generated during an interactive development session. After the control information and the locally stored hypertext documents are created at the authoring computer 30, both may be uploaded to one or more kiosk computers, such as kiosk computer 11, using a conventional modem dialup file transfer or transfers over the Internet as noted above.

The local storage of displayable information supplements and should be distinguished from the caching operations performed by conventional web browsing and proxy server software. Such caching systems typically store copies of information accessed over the Internet in local disk storage until a cache size limit is reached, and then continue to save additional data by overwriting the least recently accessed data. Because a given item of data may be altered at anytime at its origin, these caching schemes typically retrieve data from the cache only after the originating server verifies that the desired data has not been modified since it was originally placed in the local cache. For example, the Netscape Proxy Server marketed by Netscape Communications Corp., Mountain View, Calif. combines the ability to cache data accessed from the network using "if modified since" checking with a high-level access control to prohibit access to documents having a specified URL for all or specified hosts.

In accordance with the present invention, such a caching mechanism is not required and not burdened with information which the authoring computer 30 designates for storage as the original copy, and no access to an originating server is required. The performance of the display unit, such as the kiosk computer 11, is accordingly enhanced by storing a significant portion of the content locally and only requiring a slower network access to be performed for displayed information of the following kinds:

(1) information which changes so frequently that the transmission of updates under the control of the authoring computer would be inefficient, for example: weather data from a news source which includes weather map data which is updated every few minutes;

(2) information which occupies a significant amount of space and/or contains items which are individually accessed only infrequently, for example: individual topics in an online encyclopedia which, because of imbedded graphics and the like, would be time-consuming to transfer and which would consume a large amount of local storage capacity.

To the extent that information is accessed by the display unit from the network, it may be cached in the usual way to eliminate the need to access information which has not been altered by the originating server since the last cache storage was performed.

In the description to follow, attention will first be directed to the operation of the access control mechanism, including the browser, the access control programs, and the stored

access control data, as the kiosk user interactively operates the browser. Attention will then be directed to the mechanism for interactively creating those access control data structures which limit and control the user's access to information.

#### Access Control Mechanism

The operation of the user access control mechanism is illustrated generally in FIG. 2 of the drawings. Actions are initiated when the kiosk user touches a displayed link anchor on the kiosk touchscreen as depicted at 103 in FIG. 2. The resulting touchscreen signal 105 is processed by the executing web browser program 107 which responds by issuing a request 109 for the retrieval of displayable data identified by a particular URL.

The request 109 is processed by an access control mechanism indicated generally at 110 which includes a mechanism 113 for comparing the URL in request 109 with URLs in transition list 111. If the requested URL specified in request 109 is found in the list 111, a transition display page is sent to the web browser 107 while the originally requested URL is concurrently sent to the access mechanism 12. This transition display mechanism 113, described in more detail later in connection with FIG. 13, provides a mechanism for displaying one or more display pages to the user before the information identified by the requested URL is displayed.

The access mechanism 120, like the web browser program 107, is conventional. URL's which translate into local disk addresses, such as:

"file:C:\WINDOWS\Desktop\HTMLHOME.HTM"

are accessed directly from local storage, whereas URL's which identify information stored on remote servers, such as:

<http://www.micotouch.com/products/rj234.html>

are retrieved by the kiosk computer utilizing TCP/IP software, such as the dynamic link library WINSOCK.DLL for Windows 3.1 or WSOCK32.DLL supplied by Microsoft with Windows 95. Depending on the content of the URL in the request 114, the linked data specified by the URL Request 114 is obtained either from the kiosk's local storage system, illustrated by local disk 122 in FIG. 2, or by transmitting an http/ip Internet message requesting the information via a modem 124 and SLIP/PPP connection 126 to the remote Internet web server (not shown) which holds the requested information. If the access request is successfully satisfied, the access mechanism 120 returns the requested data in the form of an HTML document, graphical image, FTP file, or other displayable data identified by the URL in the request 114; otherwise, the access mechanism returns an appropriate error message which is displayed to indicate to the kiosk user that the access did not succeed.

#### Rewriting Incoming HTML Pages

When the returned displayable data is an HTML document, the text of that document is processed by the access control mechanism 110 which includes a mechanism 130 for rewriting the HTML page in accordance with information in a string list data structure 133. The string list 133 typically contains a collection of text replacement request commands each including of a designated target string and a designated replacement string. Whenever one of the target strings in the structure 133 is found within the text of an incoming HTML document, that target string is replaced by the associated replacement string before the incoming HTML document is displayed by the web browser program 107.

The HTML text replacement function performed at 130 in the access control mechanism 110 may be used to provide a number of useful functions. In addition to rewriting displayable text, the rewriting mechanism 130 may add new links to additional information which the kiosk owner may wish to communicate to the kiosk user, may delete links to information which should be hidden to the user, or may substitute replacement links. Unlike the URL transition display generating mechanism 113, which is capable of inserting one or more display pages before a page designated by the URL request 109, the mechanism 130 may be used to substitute a different target page for the page specified by a link imbedded in an incoming HTML document, and may also be used to eliminate the highlighting of, or rewrite, the displayed anchor text which is associated with the linked URL in the HTML page. The string list 133 includes a collection of target+replacement string pairs. The mechanism 130 searches the HTML page fetched by the access mechanism 120, searching for a match to each of the target strings, and when found substitutes the replacement string for the target string.

More specifically, each command stored in the string list 133 takes the form expressed by the following Pascal record definition:

```

Replacement_Command = record
    Target_Page, Target, Replacement: pchar;
    Location: Longint;
    Flag: word
End;
```

The Target\_Page, Target and Replacement fields each hold pointers to null-terminated strings (character arrays). The Location field is 32-bit integer which holds the position at which the replacement string is to be inserted (when Target is a null pointer). The Flag field holds boolean flag bits having the following significance when true:

```

Search_Normal:    Search for Target string in normal (non-anchor)
                  displayable text;
Search_Anchor:    Search for Target string in displayable anchor text;
Search_URL:       Search for Target string in URL definition
                  within anchor tags;
Case_Sensitive:   Apply case sensitivity to search for Target;
Disable_Pagewide: Disable all links on Target_Page;
```

The versatility of the text replacement mechanism 130 is illustrated by the following example replacement commands. For each example, assume that an incoming hypertext document received at the HTML rewrite mechanism 130 from the access mechanism 120 includes an imbedded "anchor tag" reading:

```
<A HREF="http://www.main.com/netspot/toc.html">Table of
Contents</A>
```

Such a tag would be displayed by the browser as the highlighted anchor text "Table of Contents" which, when touched by the kiosk user, would result in a generated request to retrieve and display the HTML document file designated by the Uniform Record Locator (URL):

```
"http://www.main.com/Internet/toc.html".
```

This URL identifies a file named "toc.html" in the "netspot" directory of the web server computer named "mentum"

which is available over the Internet using the hypertext transport protocol as indicated by the prefix "http".

#### EXAMPLE 1

If the string list 133 contains the following Target and Replacement fields:

Target: "http://www.main.com/netspot/toc.html"

Replacement: "file:c://newdir/newtoc.htm"

where the replacement string is a new URL specifying a file named "toc.htm" on the kiosk computer's disk storage directory "newdir", the effect would be to change the anchor tag in the HTML text such that the anchor text "Table of Contents" is unchanged and continues to be highlighted but, when touched, the locally stored file newtoc.htm would be retrieved by the access unit 120 and displayed instead of the file on the remote server originally specified.

#### EXAMPLE 2

Target: <A HREF="http://www.main.com/netspot/toc.html">Table of Contents</A>

Replacement: "Table of Contents"

This replacement command removes the associated link and the highlighting from the displayed text "Table of Contents".

#### EXAMPLE 3

Target: "Patent Office"

Replacement: "<A HREF='http://www.uspto.gov/'>Patent Office</A>"

This command rewrites each occurrence of the string "Patent Office" such that web browser 107 highlights the string as being an anchor text and provides a link to a publicly available home page maintained by the U.S. Patent Office whenever the anchor text is touched by the kiosk user.

#### EXAMPLE 4

Target\_Page: http://www.ajax.com/sale.html/

Target: "<Head>"

Replacement: "<Head><META HTTP-EQUIV=REFRESH CONTENT='12; URL=file:c:\newdir\resale.htm'">

This example, unlike the first three, limits the operation of the command to a designated target page and causes a <META...> element to be inserted in the document header. A Meta element is a standard HTML 3.0 element for simulating HTTP response headers in HTML documents which, in the example above, operates as a "client pull" dynamic HTML document loader. As a consequence, the inserted Meta tag causes the target page to be displayed for 12 seconds, at which time the browser automatically issues a URL request to replace the displayed target page with a page on the local hard drive specified by the content field of the inserted Meta tag.

#### EXAMPLE 5

Target\_Page: http://www.ajax.com/sale.html/

Location: 1243

Replacement: "<IMG SRC='logo.jpg' ALIGN=BOTTOM>"

This command places the replacement string at character position 1243 in the HTML document designated by the URL given in the target page field of the command. The effect in this case is the insertion into the page of a graphical JPEG image designated by the relative source file designa-



tion "logo.jpg" in the replacement string. Note that the target location value identifies a position in the original incoming HTML page, before replacement commands have been employed to rewrite the text.

#### EXAMPLE 6

Target\_Page: http://www.quigley.hotlinks.html/

Flags: Disable\_Pagewide=true;

This command is created when all links from Target\_Page are to be automatically disabled by replacing all link tags with replacement text which consists of the anchor information only.

#### Adding Insertion Pages

The transition control list 111 seen in FIG. 2 also consists of a series of structured records each of which takes the form expressed by the following Pascal record definition:

```

Transition_Command = record
    Trailing, Leading: pchar;
    Showtime: integer;
End;

```

The Trailing and Leading fields contain pointers to null-terminated strings which contain the URL's of the trailing and leading pages of page transition, respectively. The transition display mechanism 113 seen in FIG. 2 searches the transition control list to determine if the received URL request 109 contains a URL which matches a trailing URL on the list 111. If so, the page identified by the URL in the Leading field of the transition command is displayed first, and the duration of this display is specified the value contained in the Showtime field.

The operation of the transition display mechanism 113 is illustrated in more detail by the flowchart presented in FIG. 3. The transition control routine is executed by the kiosk computer during an interactive user session each time the user touches the kiosk touchscreen to cause the browsing program to generate a hypertext link request seen in FIG. 2 as URL request 109. When the transition display mechanism 113 receives that request, the routine shown in FIG. 3 is executed beginning at the entry point 151.

At 152, the transition list seen at 111 in FIG. 2 is searched. If the URL in the received URL request is found in the Trailing field of a transition command record, that record is tested at 152 to determine whether the Leading field contains a null pointer.

If no leading URL is specified, the routine selects a display page from a collection of available pages as seen at 154. This selection may be made randomly from a collection of pages placed in a predetermined directory on the kiosk computer's local hard drive (seen at 122 in FIG. 2), or by cycling through a list of insertable display page URLs. If the Leading field of the transition command contains a specific URL, that URL is included at 156 in the outgoing URL http request seen at 114 in FIG. 2.

Whether quasi-randomly selected at 154 or specifically identified as indicated at 156, the value indicating that the requested URL identifies an insertion page, and a pointer to the satisfied transition command in list 111, are passed to the HTML rewrite routine 130 as indicated at 160 in FIG. 2. The insertion page retrieved by the access mechanism 120 is then rewritten (as illustrated by Example 4 above to place a client pull <META> element in the header of the leading page which identifies the trailing page URL and the desired display duration (Showtime) in the inserted <META> element.

Alternatively, a server-push mechanism may be used to insert a sequence of one or more leading pages prior to the trailing page identified in the original link request. Using the server push mechanism, the browser 107 seen in FIG. 2 is supplied with the page sequence using the HTTP MIME protocol and the duration of each page is determined by the HTML rewrite mechanism 130 which maintains an open connection to the browser 107, enabling replacement pages to be sequentially placed on the display screen under control of the mechanism 130. Current versions of the Netscape Navigator and Internet Explorer web browsing programs support dynamic document loading using both linked client pull <META> meta elements or a server pushed sequence of HTTP MIME-partitioned pages.

In normal operation, the HTML rewrite unit 130 need only operate on those HTML documents which are accessed from the network, since locally stored HTML documents may be stored in rewritten form. In one instance, however, locally stored HTML documents should also be modified dynamically. This occurs when an attempt to access a given document from a remote server fails because the document described in link contained in a locally stored document is no longer available from the remote server. In that case, to avoid encouraging the user to attempt to access a remote document that is no longer available, the outdated link tag in the locally stored document should be rewritten to display the anchor information only and eliminate the link as illustrated by the string list command of Example 2 described earlier. This automatic suppression of the display of visual cues in connection with links that are no longer operative is particularly advantageous when the display unit is used by inexperienced users who may be confused by error messages returned by the remote server when requested documents are no longer available.

#### Interactive Access Control Development

As noted earlier, the creation of the software content of an effective interactive kiosk display system is typically quite costly. The ability to utilize existing web pages and HTML browsing software can significantly reduce these costs, so long as suitable safeguards are incorporated to prevent the user from accessing undesired web pages and to affirmatively guide the user's attention to desired information. The creation of such an access control mechanism may also be made an interactive process which may be performed by kiosk proprietors with little or no training in either programming or HTML page creation.

From the kiosk owner's perspective, the development process merely requires that the HTML pages being made available to the user be browsed to activate links to other pages, supplying link control information when requested by the development program, and adding or editing links and text to the pages which are presented. An introductory explanation of the interactive development process is best illustrated by FIGS. 4-6 of the drawings, each of which illustrates the content of a dialog box presented to the developer during the course of a development session.

During the development session, the developer operates development software, to be discussed later, which operates as a conventional web browser. FIG. 4 shows a Link Handling dialog box which is displayed each time the developer activates a link imbedded in the currently displayed document to produce a URL request. The Link Handling dialog box contains a "Target" area for the entry of information specifying the handling of the linking function, and a "Transition Display" area for the entry of information specifying the manner in which insertion pages are to be displayed prior to the requested information.

In the "Target" area of the Link Handling dialog box seen in FIG. 4, the fully qualified URL of the HTML page to be displayed next is shown at 201 at the left of a preview button 203. By pressing the button 203, the developer may view (but not link from) the document identified by the URL displayed at 201. The developer may select among the options OK, Prevent and Substitute made available by the radio buttons 205.

If "Prevent" is selected using radio buttons 205, the remaining controls on the display are greyed to indicate they are disabled, with the exception of the preview button and the radio buttons at 207 which allow the developer to specify whether the choices made on the dialog box are to be applicable to all occurrences of links to this target URL, or only to the particular link whose activation caused the Link Handling dialog box to be displayed. The "Prevent" option is implemented by placing a replacement command record in the string list 133 which identifies the Target URL, sets the boolean values Search\_URL to true, Search\_Anchor to false, Search\_Normal to false and Case\_Sensitive to false. Target\_Page and Replacement both contain null strings, unless radio buttons 207 are set to indicate that only this specific link is to be disabled, in which case Target\_Page and Location are set to specify the page and character location respectively of the beginning of the link to be disabled.

If the radio buttons 205 are set to indicate that a different target should be substituted for the target whose URL is shown at 201, the "Substitute" button is selected which enables a drop-down edit box 211 and browse button 213. When the drop-down button at the right-hand end of drop-down edit box 211 is depressed, the URL's of the locally stored pages are displayed, enabling one file of those to be directly. Alternatively, the URL of a local or remote page may be entered into the edit box 211 or the browse button 213 depressed to display a conventional filename browsing dialog box for locating desired files anywhere on the local hard drive. When "Substitute" is selected, the originally requested URL display at 201 is greyed and the preview button 203 when pressed displays the substitute file whose URL is shown in the edit box 211. The substitution of a different link is implemented by placing a replacement record in the string list 133 which uses the Target and/or Location fields, as well as the Search\_URL flag, to identify the link to be modified, and places the new target's URL in the replacement field. The replacement command of Example 1 described above may be generated by selecting the "Substitute" option in Link Handling dialog box of FIG. 4.

The handling of the target page identified at 201 may be further defined using the dialog box of FIG. 4 by the checking checkbox 215 labeled "Link No Further" to disable all of the links on the target page in the manner previously discussed in connection with the string replacement command Example 6.

The target area of the dialog box of FIG. 4 also includes a checkbox 214 which can be checked by the developer to indicate that a remote web page should be stored locally on the kiosk computer. In that event, a copy is made of the page identified by the URL displayed at 201, along with copies of all imbedded graphics identified by <IMG> tags. An entry is then made in a locally stored lookup table to which the access control unit 120 refers to convert link requests directed to the original remote URL into requests directed to the new locally stored file. No rewriting of the links themselves is required. As discussed later in conjunction with FIG. 9, HTML pages which are stored locally, including

those which were locally stored at the request of the developer, may be rewritten in accordance with the stored string replacement commands on list 133 at the conclusion of the development session, eliminating the need for performing revisions during the browsing session. As previously discussed, remotely stored information which is subject to frequent or unpredictable change, such as weather reports, price lists, new services, etc., or which is quite voluminous and only infrequently accessed, should normally not be locally stored but instead remotely accessed. The checkbox 214 is disabled (checked and greyed) when the target page specified by the URL displayed at 201 is already locally stored.

The target area of FIG. 4 also includes controls 216-218 which enable the developer to assign a reward/penalty value to each target page. Each target page is initially assigned a neutral default reward/penalty value of zero, but may be assigned a value varying from a penalty of -10 to a maximum reward of +10. When a browsing session is initiated by the first link from the root attract page, the session-points-remaining value is set at a predetermined value determined by the user entries at 510 and 512 in the dialog box seen in FIG. 10, discussed later. As the session continues, the access control system 110 decrements this value by at the rate, for example, of 5 points per second for "neutral pages" but increases the rate to 15 points per second for heavily penalized pages, whereas pages set to a reward value of +5 result in no change, and reward values of +10 actually cause the session-points-remaining value to increase at the rate of 5 points per second. Whenever the accumulated points reaches zero the session is terminated by displaying an insert page reading "Your Time Has Expired. Next User Please", and returning to the attract page.

The scrollbar control 216 with the slider 217 provides a convenient mechanism for setting the reward/penalty value as desired, indicating to the user that viewing certain pages is to be encouraged while viewing other pages is to be discouraged. In this way, users who are viewing pages which the kiosk proprietor favors earn longer session times than viewing disfavored pages.

When the developer actuates a link during the development session, the Link Handling dialog box seen in FIG. 4 also provides a mechanism for requesting and identifying the display of a transition page prior to the display of the target page specified in the target area as described above. The radio buttons allow the specify "None" to indicate that no page is to be displayed prior to the target page; "Random" to specify that an insert page is to be selected from the collection of available insert pages, and "Selected" to indicate that the particular page entered into drop down edit box 223 is to be inserted. The drop down button at the right of edit box 223 causes the display of a drop down list of all insert pages in the collection of available pages from which a selection may be made. Alternatively, a URL may be entered directly into the edit box 223 or selected using a conventional filename selection dialog box activated when the adjoining browse button 225 is pressed.

The duration of the inserted page may be set by entering a number in the edit box 230. This number is then placed in the <META> statement along with the insertion page name to control the dynamic loading of the original target URL page after the display of the insertion page as previously described in connection with FIG. 3.

The dialog box seen in FIG. 5 is displayed whenever the user performs a right-button mouse click when the cursor is on a word or when displayed text has been selected using a standard left-button-depressed text selection dragging

operation. When a word or string is selected, depressing the right-hand mouse button produces a set of conventional options (Copy, Cut, etc.) and the additional option "Replace" which, when chosen, displays the dialog box seen in FIG. 5 with the selected word or text appearing as the default in the Find edit box 240. Using the check boxes at 241, 243, 245, and 247, the developer indicates whether or not the string displayed in edit box 240 is to be replaced on a case sensitive basis, and whether it is to be replaced when found in normal displayed text, anchor text or in a URL, respectively. The replacement text, which may be lengthy, is entered into a memo box 248 as seen in FIG. 5. The radio buttons 249 allow the developer to specify whether all occurrences of the text in edit box 240 are to be rewritten as indicated by the dialog box, or only the specific text which was identified when the dialog box was opened. The dialog box seen in FIG. 5 can also be opened by menu selection, in which case the radio buttons 249 are greyed and disabled. The replacement command Example 2 discussed above may be produced using the String Replacement dialog box seen in FIG. 5.

By right-clicking the mouse on "white space" (e.g., a position between words or images) of the currently displayed page, a pop-up menu is produced which includes the entry "Insert Link" which, if chosen, displays the dialog box of FIG. 6. Alternatively, right clicking on existing anchor text or image causes the pop-up menu to include the option "Edit Link" which, if selected, causes the dialog box of FIG. 6 to be presented with the included controls already filled in; that is, if anchor text was selected, that text appears in the memo box 251 and if an anchor image was selected, the S.C.=URL for that image appears in a drop down edit box 253. Likewise, the URL of the target of the link is displayed in a drop down edit box 257.

The data gathering functions provided by the dialog boxes seen in FIGS. 4-6 of the drawings is further illustrated by the flow charts seen in FIGS. 7 and 8.

FIG. 7 illustrates the operation of the dialog box of FIG. 4. The dialog box is displayed in response to the issuance of a linking request by the development system web browser as seen at 301 in FIG. 7. The radio buttons 205 of FIG. 4 accept a selection within the decision box 303 in FIG. 7. If a substitution is selected, the developer supplies the URL of the new target at 305 using the edit box 211 seen in FIG. 4. Appropriate entries are then made into the string list seen at 133 in FIG. 133 as seen at 305, 307 and 309 in FIG. 7.

The lower portion of the flow chart seen in FIG. 7 illustrates the procedure followed to utilize the entries in the transition display section of the dialog box seen in FIG. 4. The decision block 311 of FIG. 7 accepts the selection made by the user using the radio buttons 221 of FIG. 4. Based on the remaining data entered on in the transition display section of the dialog box, an appropriate record may be added to the transition list 111 seen in FIG. 2 as indicated at 313, 315, 317 and 319 in FIG. 7.

The flow chart seen in FIG. 8 illustrates the procedure followed to utilize the information entered in the dialog boxes shown in FIGS. 5 and 6. As described earlier, right clicking the mouse on the displayed page displays a pop-up menu which supplies the developer with the option of replacing displayed text or inserting a tag at the position in the displayed page indicated by the mouse click. If the mouse is clicked on a word or on a selected string which is not highlighted anchor text as determined at decision block 325, the dialog box of FIG. 5 is displayed to provide the information collected in steps 327-330 of FIG. 8. Alternatively, a menu selection can also invoke the display

the dialog box of FIG. 5 as indicated at 333. If the developer right clicks the mouse on displayed anchor text, an anchor image, or on whitespace, the dialog box of FIG. 6 is displayed to obtain information descriptive of a new anchor as indicated at steps 341-343 in FIG. 8.

#### Automated Development Session

To insure that the developer does not overlook any links which may or may not be left operative on pages presented to the kiosk user, it is advantageous to automate the task of scanning each page for links and automatically presenting those links to the developer who may then elect the treatment to be accorded each link. The automated development procedure illustrated by the flow chart of FIG. 9 provides such a mechanism.

The automated development session depicted in FIG. 9 begins with the display of the kiosk's "attract page" which constitutes the root page for the hierarchy of pages which are associated by hypertext links. The attract page, illustrated by the page 81 seen in FIG. 1, is advantageously stored on the kiosk computer's local hard drive during normal use. In the absence of any activity by a user of the kiosk for a predetermined timeout duration, the kiosk computer automatically restores the display of the attract page so that all users are presented with the same beginning point.

Display pages which are not linked directly or indirectly to the attract page are not accessible to the kiosk user. The set of presentation pages which will be made available to the user is defined by the combination of (1) the locally stored pages on the kiosk computer's hard drive linked to the attract page; (2) remotely stored pages linked to those locally stored pages; and (3) other remote pages to which linking is permitted from remotely stored pages by the access control information, including additional links, stored in the transition list 111 and the string list 133 seen in FIG. 2. The development session, typically carried out by a computer such as the authoring computer 30 seen in FIG. 1 which is remote from but in communication with the kiosk computer (s), accordingly consists of the steps of making available the locally stored pages, establishing a connection via the Internet (or a similar connection) to one or more remote servers which store the remotely stored pages, and evaluating those available pages and the links imbedded in each to develop the access control found in the two lists and to specify which pages accessed via the network are to be locally stored and which are to remain accessible only by a network access.

Thus, at entry point 401 seen in FIG. 9, the development session begins with the root attract page being the current page undergoing evaluation. At step 402, each page is scanned for the presence of links at 403 unless that page has been previously identified as being a page from which no more further linking is to be permitted as previously explained in connection the checkbox 214 shown in FIG. 4. If the linking is to be prohibited from all links on the current page, the page is processed at 404 by posting to the string list 133 a replacement command record having a Target\_Page field set to the URL of the current page and the boolean flag bit Disable\_Pagewide set to TRUE. As previously noted in connection with the string replacement command Example 6, the HTML rewrite mechanism 130 seen in FIG. 1 responds to this command by replacing each the linking tag in an HTML being accessed with the imbedded anchor information alone, thereby disabling each link and removing the highlighting or other visually linking cue which would otherwise be added by the browser to identify the presence of these links. Note that the command created at step 404 eliminates the need for the user to individually enable or disable links on a page which may contain large numbers of links.



When linking from the current page is permitted, each link is processed by the content developer as indicated at step 403-409 in FIG. 9. The current hypertext page is scanned, beginning at the start of the document, for the first (next) hypertext link to another page. If an imbedded link is found, as indicated by the "Yes" result branch at decision block 405, the link handling dialog box depicted in FIG. 4 (and the detailed flowchart of FIG. 7) is displayed for a response by the developer as seen at 407. As previously discussed, the link handling dialog box permits the developer to preview the target page specified by the detected link and to choose whether to accept (OK) the link, prevent the link from being activated, or substituting a link to a different page as indicated by decision block 409 in FIG. 9. In addition, as seen in the dialog box of FIG. 4, the content developer may specify whether a given target page is to be locally stored if currently accessed from the network, and whether further links from that page are to be disabled as a group (by checking checkbox 214 on FIG. 4) or individually processed.

If the developer elects to prevent an individual link by selecting either "Prevent Here" or "Prevent Everywhere" using the radio buttons 205, the string list 133 is updated as previously discussed in connection with step 309 seen in FIG. 7, and a return is made to the page scan step 403 to search for the next link on the current display page.

If the developer accepts the imbedded link, or substitutes a different link, the currently displayed page identification is pushed into a software stack as indicated at step 411, the newly specified target becomes the current display page as seen at step 413, and scanning of that the new current page is begun by returning to the scanning step 403.

When there are no further links to evaluate on the current page, as indicated by the No branch from decision block 405, the user is given the opportunity at step 417 to modify the displayed text using the string replacement dialog box of FIG. 5 as seen at step 419, which may be activated at step 417 either by menu request or by right clicking on a word or selected text in the displayed document as previously discussed. The replacement string specified in dialog box 5 is also evaluated at step 421 to determine if it contains a link to a hypertext page and, if so, the identified link is evaluated in the usual fashion by returning control to the dialog box of FIG. 4 as indicated by branch 420. Otherwise, the user is given the opportunity the enter further replacement strings as indicated by branch 422.

In a similar fashion, as indicated at decision block 431, the user is also given the opportunity to use a right mouse click to further edit an existing link, or add an entirely new link, by right-clicking on white space or a link anchor as indicated at 325 and 341-343 of FIG. 8 to invoke the link description dialog box of FIG. 6 as seen at step 432 of FIG. 9. If the developer elects to define a new link, as indicated by the yes branch 435 from decision block 433, control is returned to step 407 to enable the dialog box of FIG. 4 to be used to add a transition display if desired. Otherwise, the display of the current page is continued such that the developer can add or modify additional links or add additional string replacement commands.

When the user indicates that no additional editing of the current page is required, and when all remaining hypertext links on the current page have been authorized, no further processing of the current page is required as indicated at branch 440, the page which contained the link to the current page is popped from the stack to become the new current page as indicated at step 441. If the stack is empty, indicating that all links from the attract page have been resolved, the

development session is concluded; otherwise, the page popped from the stack becomes the new current page as indicated at step 413 and scanning of that page resumes at step 403 which searches for the next unresolved link.

FIG. 10 of the drawings illustrates the on-screen appearance of the dialog used to obtain information from the user which may be employed to limit the duration of a given user session while FIG. 11 is a flow chart which illustrates the manner in which this information is utilized to control the session duration. The dialog box of FIG. 10 is displayed on request by the user, or automatically the beginning or end of each development session, and includes the following controls: an edit box at 510 which accepts a numerical quantity indicating the number of minutes each session may continue before links to further pages are disabled by employing the HTML rewrite mechanism seen at 130 in FIG. 2 to rewrite all link tags as anchor information alone; and an edit box 512 which accepts a numerical quantity indicating the number of minutes each session may continue before the session is mandatorily terminated by returning the user to the home page, accomplished by utilizing the transition display mechanism 133 of FIG. 2 to issue a URL request for the home page.

Note that the URL request which forces the return to the home page may be accompanied by a predecessor transition display page which displays a warning notice, e.g., "TIME EXPIRED. NEXT USER PLEASE.". In addition, to further discourage the current user from continuing to use the display unit, the home page may require the mandatory completion of an HTML "registration" form which requests identification data from a user, such as name, mailing address, phone number, date of birth, etc. This demographic data is then recorded and may be used to produce a user evaluation number. By way of example, the evaluation number may be generated by a combination of the user's age and zip code, generating a maximum valuation number for adults living in a particular area and a minimum valuation number for children living far from the kiosk location.

As illustrated at 514 in FIG. 10, the developer uses two list boxes to develop session time adjustment profiles based on the time of day when the display unit is being displayed (left hand list box at 514) and the user valuation number produced from the demographic data as noted earlier (the right hand list box at 514). In this way, session durations greater than the default values entered at 510 and 512 are allowed at those times during the day when little usage is likely, and reduced session times during the busiest hours. Similarly, using the adjustment profile recorded in the right hand list box at 514, adjustments to the session times may be made based on the user valuation number. Changes to individual entries in either the time-of-day adjustment profile in the left list box at 512 or the user valuation profile in the right list box at 512 are made by clicking on an individual item and changing the adjustment value in the spinner-driven edit box at 516.

#### Session Timing and Logging Mechanism

Session timing is accomplished by an interrupt or timer driven routine as illustrated in FIG. 11. Upon each occurrence of a system time interrupt, the routine is entered at 521 and a count value CNT is incremented. If CNT is evenly divisible by a value IC (with IC having a value selected such that the routine beginning at 527 is entered every 10 seconds, for example), a session count value is incremented (or decremented) by PageValue at 527, incremented (or decremented) by UserValue at 529, and incremented or decremented by TimeValue at 531. The session count value

SC is initialized to zero at the beginning of every new session and counts upward toward limit values LinkVal, which establishes a session duration threshold at which further linking is terminated, and EndVal, which establishes a session duration threshold at which the session is terminated entirely. PageValue is a positive or negative integer which adjusts the amount by which SC changes (upwardly or downwardly) based upon the value entered by the user for the current page being viewed when that page was ranked using the controls 216-218 in the dialog box seen in FIG. 4. UserValue is a positive or negative integer reflecting the weight given to the user valuation in the right hand list box 514 of FIG. 10, with the valuation number being derived from the demographic data entered during user registration as discussed above. Finally, the count SC is adjusted by TimeValue comprising the combination of a fixed positive base value which reflects the passage of time as adjusted by a time-of-day adjustment obtained by comparing the current time of day with the time-of-day profile value entered by the developer in the left hand list box 514. Together, PageValue, UserValue and TimeValue quantities provided by the developer control the rate at which SC advances toward the thresholds LinkVal and EndVal which are set by the developer's entries at 510 and 512 respectively as seen in FIG. 10.

When SC is greater than LinkVal as determined at 533, the link disabling process in HTML rewrite mechanism 130 is turned ON as indicated at 536. If the session count value SC is also larger than EndVal as determined at test 538, the session is terminated as indicated at 539.

The timer driven interrupt handling routine seen in FIG. 11 further includes a mechanism for logging session usage. Each time the interrupt count CNT is divisible by the integer MC (which is selected such that the test at 525 is performed once per second, for example), a test is performed at 525 to determine if the current page being displayed has changed since the last test at 525, a determination made by comparing the URL of the current page with the string LASTURL saved during the last detected transition. If URL is not equal to LASTURL, an entry is appended to a log file consisting of records each comprising the new URL, the time of day at which the page designated by the URL was first displayed, and an integer identifying the current user by specifying the record number for that user in a file of registration records accumulated for the user from CGI processing of the home page registration form. In this way, a log file is maintained from which the entire viewing history for each user may be reconstructed, the amount of usage for each HTML document (total occurrences and average viewing time), and data correlating the demographic data with the available content. Such data is of particular value to the content developer since it enables the developer to identify pages which were of interest to users, pages which were frequently accessed from the network and are hence candidates for local storage, etc. As noted earlier in connection with FIG. 1 of the drawings, this demographic and usage log data may be transmitted to the authoring computer by establishing a file transfer connection via a conventional modem-to-modem route over the dialup telephone lines, or by using the Internet to perform an FTP or SMTP transfer.

When the current URL is found at test 525 to be unchanged from LASTURL, a further test is performed at 540 to determine if the current time exceeds LT, a time value saved at 526 when the current URL was first detected, by more than a idle time value Q. When  $\text{Time} > \text{LT} + \text{Q}$ , it is established that the current page has been on screen for more than time Q with no user activity; consequently, since the display unit is apparently not being used, the session is

ended by branching to 539 such that the attract (home) page is again displayed for viewing by the next user.

#### Information Exchange

The sequence of events which occur during the overall operation of a display unit, such as the kiosk 10 seen in FIG. 1, is depicted by the flow chart of FIG. 12.

Before the display unit is first operated, it must receive the locally stored displayable information files as well as the control structures developed as described in connection with FIG. 9 consisting of the string list seen at 133 in FIG. 1, the transition list seen at 111 in FIG. 1, and the lookup table 112 seen in FIG. 1. As previously noted, these files are advantageously created using the interactive content authoring system described above at a remote authoring station, such as the computer 30 seen in FIG. 1, and are transferred to the display unit's local storage by a file transfer via the dialup telephone system or by Internet FTP transfers as seen at step 571 in FIG. 12.

Each session begins, as indicated at 572, by initializing the CNT, SC, and LASTURL variables, by turning off the link disabling mechanism if it has previously been turned ON as described in connection with step 536 seen in FIG. 11, and by issuing a URL request for the display of the home (attract) page. As previously noted, the home page or its necessary successor advantageously includes a registration form which is directed to a local CGI (Common Gateway Interface) processing facility which appends a record to a file of records containing user identification information as indicated at 574 and 575 in FIG. 12.

During the course of the session, as each new page is accessed, the URL for that page, its start time, and an identifying number specifying the current user is appended to a log file of URL usage records as indicated at 576 and 577 (previously described in connection with step 526 in FIG. 11). When the session ends by a timeout condition being detected as indicated at 578 (tests 538 and 540 in FIG. 11), if the display unit is determined to be idle at 580 (based on test 540 in FIG. 11), the display unit makes use of the idle time to perform housekeeping information transfers as indicated at 590-596 in FIG. 12. First, a link is established to a supervisory computer (typically a host computer on the Internet which can receive information using FTP or SMTP transfers) at 590 and thereafter the previously untransmitted portion of the usage record file is transmitted as indicated at 592 and the previously untransmitted user records are transmitted at 594.

Then, as indicated at 596 in FIG. 12, the records in the lookup table are processed sequentially by transmitting an "if modified since" message to the server holding each file designated by an origination URL in the lookup table. If it is determined that the file identified by the origination URL has been modified since the locally stored copy was created (perhaps by the authoring computer) or last updated by the individual display unit, the newly revised copy is accessed and stored after being passed through the HTML rewrite unit 130 which alters the newly stored local copy in accordance with the commands contained in the string list 133.

The mechanism for updating stored files which originated from remote locations is illustrated schematically in FIG. 13 of the drawings. The left hand flow chart in FIG. 13 illustrates the manner in which the lookup table, shown generally at 600, is used to redirect URL requests for remotely stored documents such that they instead retrieve locally stored copies. The right hand flow chart of FIG. 13 shows how the lookup table 600 is employed to periodically update the stored information so that it takes into account modifications to the files as they exist in the remote servers.

Both of the routines illustrated in the flow charts of FIG. 4 are executed by the transition display control mechanism seen at 113 in FIG. 2. The routines manipulate and respond to values stored in lookup table 600 which consists of a plurality of entries, one for each remote file stored in local storage, each entry consisting of four fields: an originating URL field 603, a Chck field 604 storing a time stamp indicated when the entry was last validated, a Mod field 605 storing a time stamp indicating when the corresponding local file was stored or last updated, and a local URL field 607 specifying the local storage location of the local copy of the file.

When the control unit 113 receives a URL request which specifies a remotely located file, that file may have been locally stored at the request of the content developer (using the Make Local checkbox 215 seen in FIG. 4), in which case a copy of the file originally designated by an originating URL is placed in local storage at a location specified by a local URL in field 607.

During the operation of the display unit, when the user activates a link to generate a URL request seen at 109 in FIG. 2, the routine beginning at the entry point A at 609 is entered. If the URL contained in the request specifies a remote URL, a search is conducted to determine if the requested remote URL is in the lookup table 600, indicating that a local copy is available. To speed the search, the entries in lookup table 600 are advantageously sorted into order by originating URL, permitting a binary search for a matching entry to be conducted as indicated at 611. If a match is found, the local URL from field 607 is substituted for the URL in the request being processed as indicated at 615 to redirect that request to the local copy. The lookup routine concludes at exit point B indicated at 617 in FIG. 13.

When the display unit is idle and the routine at 596 is called as indicated in FIG. 12 to verify the integrity of the stored files against the remote originals, the routine beginning at entry point C as seen at 619 in FIG. 13 is called. Each time the routine is entered, one of the entries pointed to by a counter value FP is checked. If the entry pointed to by FP contains a time stamp in the Chck field which differs from the current time by less than W as indicated by the test 621, no further updating is needed and the routine terminates at exit point D seen at 622. The value of W specifies the frequency at which updating is performed. Thus, if W is set to a value equivalent to 30 minutes, the entries in table 600 are checked until an entry is found that was checked less than 30 minutes previously.

The validation performed at 623 is performed by issuing an if-modified-since message to the server specified by the URL in the originating URL field 603 pointed to by FP, together with a specification of the time stamp found in the Mod field 605 of that entry. If the remote server responds with an indication that the original file has been modified since the time indicated by Mod, the modified version is retrieved and stored locally, as indicated at 627, and the table entry pointed to by FP is updated with the current time value in both the Mod field 605 and the Chck field 604, as well as placing the new local storage URL (if necessary) in field 607. If no updating is necessary, the Chck field 604 alone receives the current time value. So long as the display unit continues to be idle as indicated by the test at 630, the testing of the validity of the entries in table 600 can continue and FP is incremented at 629 to check the next entry. If a user has activated the unit, the checking is terminated by exiting to point D at 622. The value FP is retained so that, when the validation routine is again entered at 619, checking will continue with the oldest unchecked entry.

Note that, as an alternative to performing the validation routine at the display unit as indicated at 596 in FIG. 12, a supervisory computer may be used to periodically verify the integrity of the local files stored in the individual satellite display units by performing the validation routine at intervals to identify files to be updated. When such testing reveals that a locally stored file should be updated, the supervisory computer may retrieve the modified file from the remote server and then transfer that file to each satellite display unit when that unit establishes contact with the supervisor; that is, instead of performing its own validation at 596, the satellite instead accepts the transfer of identified update files from the supervisor, eliminating the need for the individual display units to independently test their local files against the originals, and further eliminating the need for the satellite computers to maintain the Chck and Mod fields in the lookup table 600, these fields being maintained solely by the supervisory computer which performs the routine shown at the right in FIG. 13.

It is to be understood that the specific embodiment of the invention which has been described above is merely illustrative of one application of the principles of the invention. Numerous modifications may be made to the apparatus and methods described without departing from the true spirit and scope of the invention.

What is claimed is:

1. A system for displaying hypertext information comprising, in combination,

a supervisory computer for generating a control information file and one or more hypertext document files, and at least one display unit comprising, in combination: a local processor, a display screen, input means for accepting data requests from a user, communications facilities for receiving said control information file and said hypertext document files from said supervisory computer, and local storage means for storing said control information file and said document files, wherein said control information file includes at least one item which specifies a selected document file in said local storage means and the remote location of an original file from which said selected file was copied, and wherein said local processor includes local file validation means comprising:

means responsive to said one item in said control information file for retrieving an attribute of said original file from said remote location via communications facilities,

means for using said attribute to determine whether said original of said selected file has been modified, and

means for replacing said selected file with a new copy of said original transferred from said remote location via said telecommunications facilities when said means for using said attribute indicates that said original has been modified.

2. A system as set forth in claim 1 wherein said local processor further including means for detecting an idle condition when no data requests are being received from a user and means for activating said local file validation means in response to a detected idle condition.

3. A system as set forth in claim 1 wherein said local file validation means further comprises means for recording the prior time at which said selected file was last compared with said attribute and means for inhibiting the operation of said means for retrieving an attribute of said original file when less than a predetermined period has elapsed since said prior time.



4. A system as set forth in claim 1 wherein said control information file comprises a plurality of entries each of which associates the identification of a specific one of said document files in said local storage means with the remote location specification of an original file from which said specific file was copied, and wherein said local processor further includes means responsive to a data request from a user which includes a particular remote location specification for displaying that document file in local storage which is associated by an entry in said control information file with said particular remote location specification.

5. A system as set forth in claim 1 wherein said local processor further includes means for recording each data request received from said user to form a log file and means for transferring said log file to said supervisory computer via said telecommunications facilities.

6. A system as set forth in claim 5 wherein said local processor further includes means for further recording the time when each of said data requests is received from said user in said log file.

7. A system as set forth in claim 5 wherein said local processor further includes means for further recording the identity of each of said user in said log file.

8. A system as set forth in claim 1 wherein said control information file includes data associating at least one of said document files with a remote record locator value specifying the location of an original document in a remote computer from which said one document file was copied, and wherein said local processor includes means responsive to a data request containing said remote record locator value for displaying said one document file from said local storage means.

9. A system as set forth in claim 8 wherein said local processor further including means for detecting an idle condition when no data requests are being received from a user and means for activating said local file validation means in response to a detected idle condition.

10. A system as set forth in claim 8 wherein said local file validation means further comprises means for recording the prior time at which said selected file was last compared with said attribute and means for inhibiting the operation of said means for retrieving an attribute of said original file when less than a predetermined period has elapsed since said prior time.

11. A system as set forth in claim 8 wherein said local processor further includes means for recording each data request received from said user to form a log file and means for transferring said log file to said supervisory computer via said telecommunications facilities.

12. A system as set forth in claim 11 wherein said local processor further includes means for further recording the time when each of said data requests is received from said user in said log file.

13. A system as set forth in claim 11 wherein said local processor further includes means for further recording the identity of each of said user in said log file.

14. Display apparatus for displaying a sequence of items of hypertext information from a set of such items designated by an author, the set of items including locally-stored copies of remotely-located original hypertext items and the apparatus comprising:

a link rewrite specification made in response to a first input from the author, the link rewrite specification

indicating at least links containing location information for remotely-located original hypertext items that are to be rewritten to contain location information for the locally-stored copies;

a link rewriter which automatically rewrites links in hypertext items fetched for display as specified by the link rewrite specification; and

a hypertext item fetcher which responds to activation of a link by a user of the display apparatus by fetching the hypertext item at the location specified by the link.

15. Display apparatus for displaying a sequence of items of hypertext information from a set of such items designated by an author, the set of items including locally-stored copies of remotely-located original hypertext items and the apparatus comprising:

a local copy specification made in response to an input from the author, the local copy specification containing location information for remotely-located original hypertext items, location information for the locally-stored copies, and consistency checking information for determining whether a locally-stored copy whose location information is in the local copy specification should be checked for consistency with its original hypertext item; and

a consistency checker which checks the consistency of the locally-stored copy when the consistency-checking information so indicates, and if the locally-stored copy is inconsistent, replaces the locally-stored copy with a new copy of the remotely-located original.

16. The display apparatus set forth in claim 15 further comprising:

a hypertext item fetcher which responds to activation of a link by a user of the display apparatus by using the local copy specification to examine location information in the activated link to determine whether there is a locally-stored copy of the hypertext item specified by the location information and if there is, fetching the local copy instead of the remotely-located original.

17. The display apparatus set forth in claim 15 further comprising:

a link rewrite specification made in response to a first input from the author, the link rewrite specification indicating at least links containing location information for remotely-located original hypertext items that are to be rewritten to contain location information for the locally-stored copies;

a link rewriter which automatically rewrites links in hypertext items fetched for display as specified by the link rewrite specification; and

a hypertext item fetcher which responds to activation of a link by a user of the display apparatus by fetching the hypertext item at the location specified by the link.

18. The display apparatus set forth in claim 17 wherein: the hypertext item fetcher further responds to activation of a link by a user of the display apparatus by using the local copy specification to examine location information in the activated link to determine whether there is a locally-stored copy of the hypertext item specified by the location information and if there is, by fetching the local copy instead of the remotely-located original.

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**United States Patent** [19]  
**Hartley-Urquhart**

[11] **Patent Number:** **6,167,385**[45] **Date of Patent:** **Dec. 26, 2000**[54] **SUPPLY CHAIN FINANCING SYSTEM AND METHOD**0858057A2 8/1998 European Pat. Off. .  
0 978 795 A2 7/1999 European Pat. Off. .... G06F 17/60[75] **Inventor:** **William Roland Hartley-Urquhart,**  
New York, N.Y.[73] **Assignee:** **The Chase Manhattan Bank, New**  
York, N.Y.[21] **Appl. No.:** **09/203,208**[22] **Filed:** **Nov. 30, 1998**[51] **Int. Cl.<sup>7</sup>** ..... **G06F 17/60**[52] **U.S. Cl.** ..... **705/35; 705/39; 705/28;**  
**705/37; 705/7; 705/8**[58] **Field of Search** ..... **705/7, 8, 35, 39,**  
**705/28, 37**[56] **References Cited****U.S. PATENT DOCUMENTS**

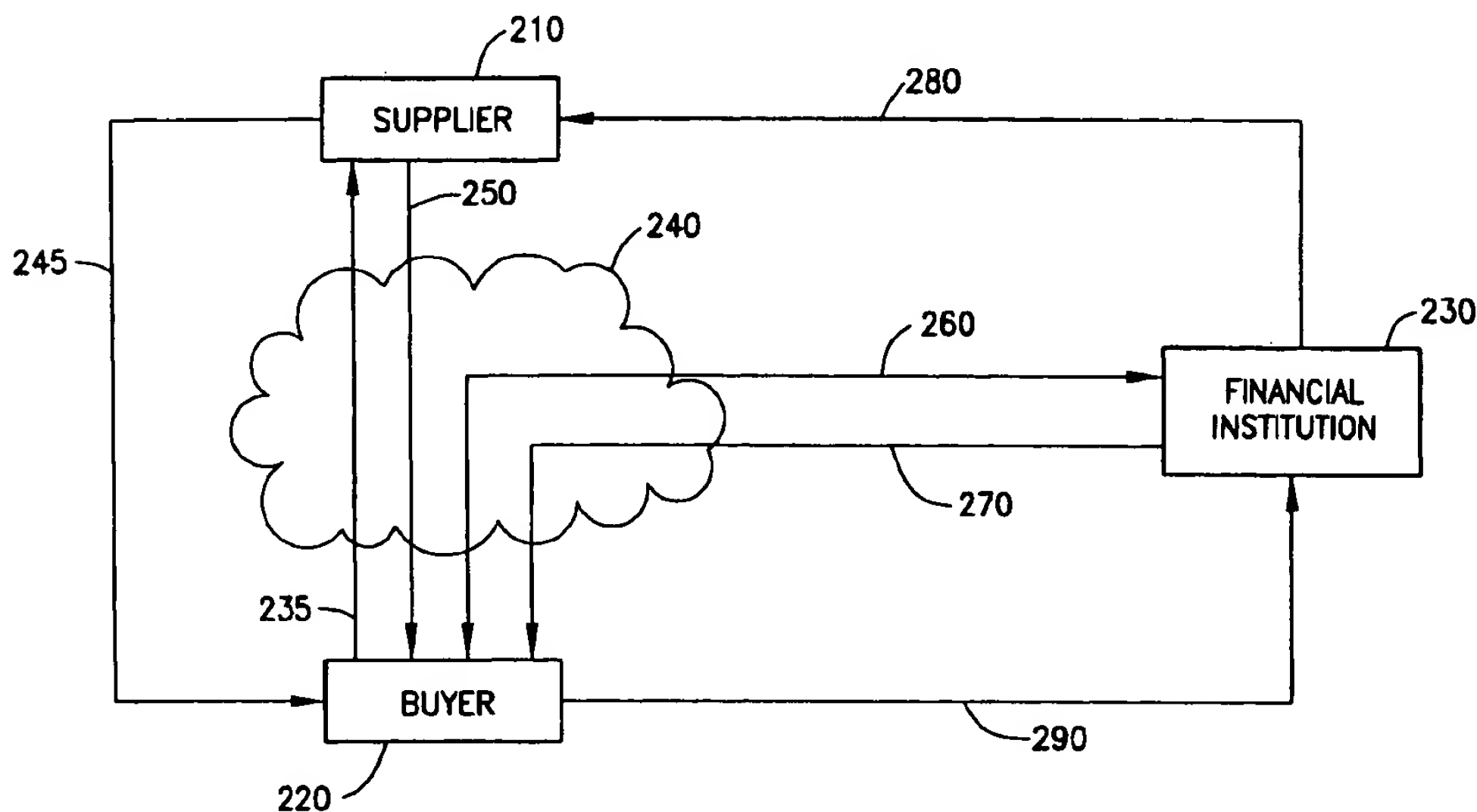
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LLP[57] **ABSTRACT**

A method for financing a supply of goods (a supply chain) from a supplier to a buyer in which the buyer has a lower cost of funds than the supplier. According to the method, the buyer generates a purchase order for the goods which is forwarded to the supplier who in turn ships the goods to the buyer. The supplier sends an invoice to the buyer which stores the invoice data in a database. The financing institution electronically accesses the database to retrieve the daily invoices. The financial institution then calculates the financing applicable to the shipped good and forwards a payment to the supplier. Upon maturity of the financing, the buyer settles with the financial institution by remitting the gross proceeds.

**24 Claims, 5 Drawing Sheets**

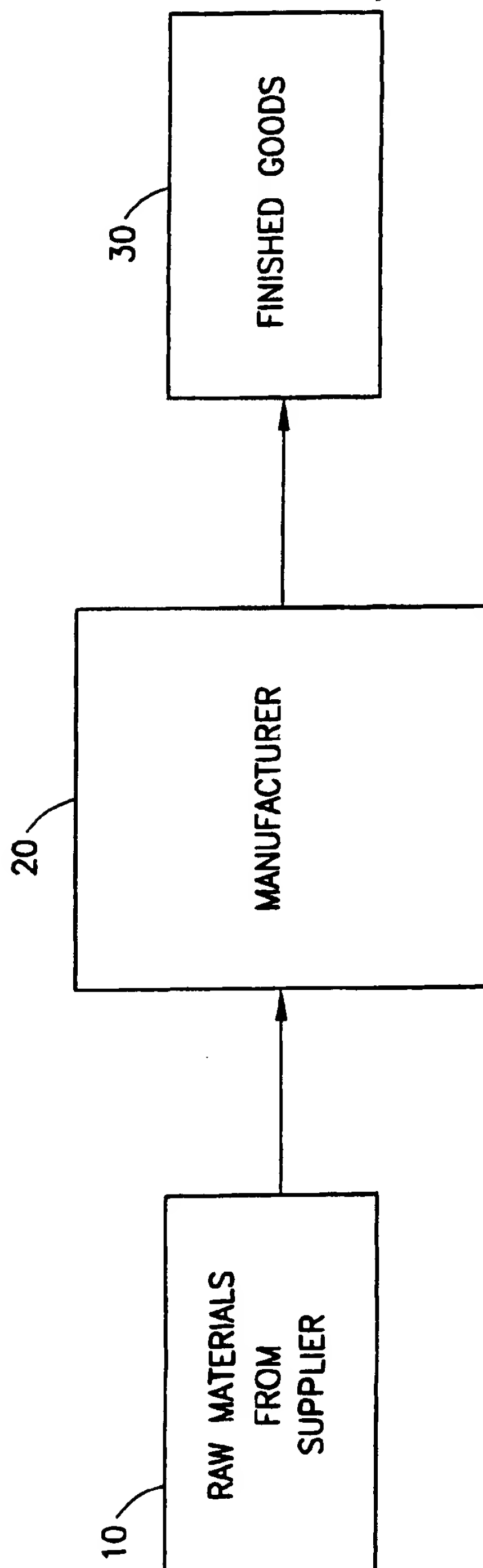


Fig. 1  
Prior Art



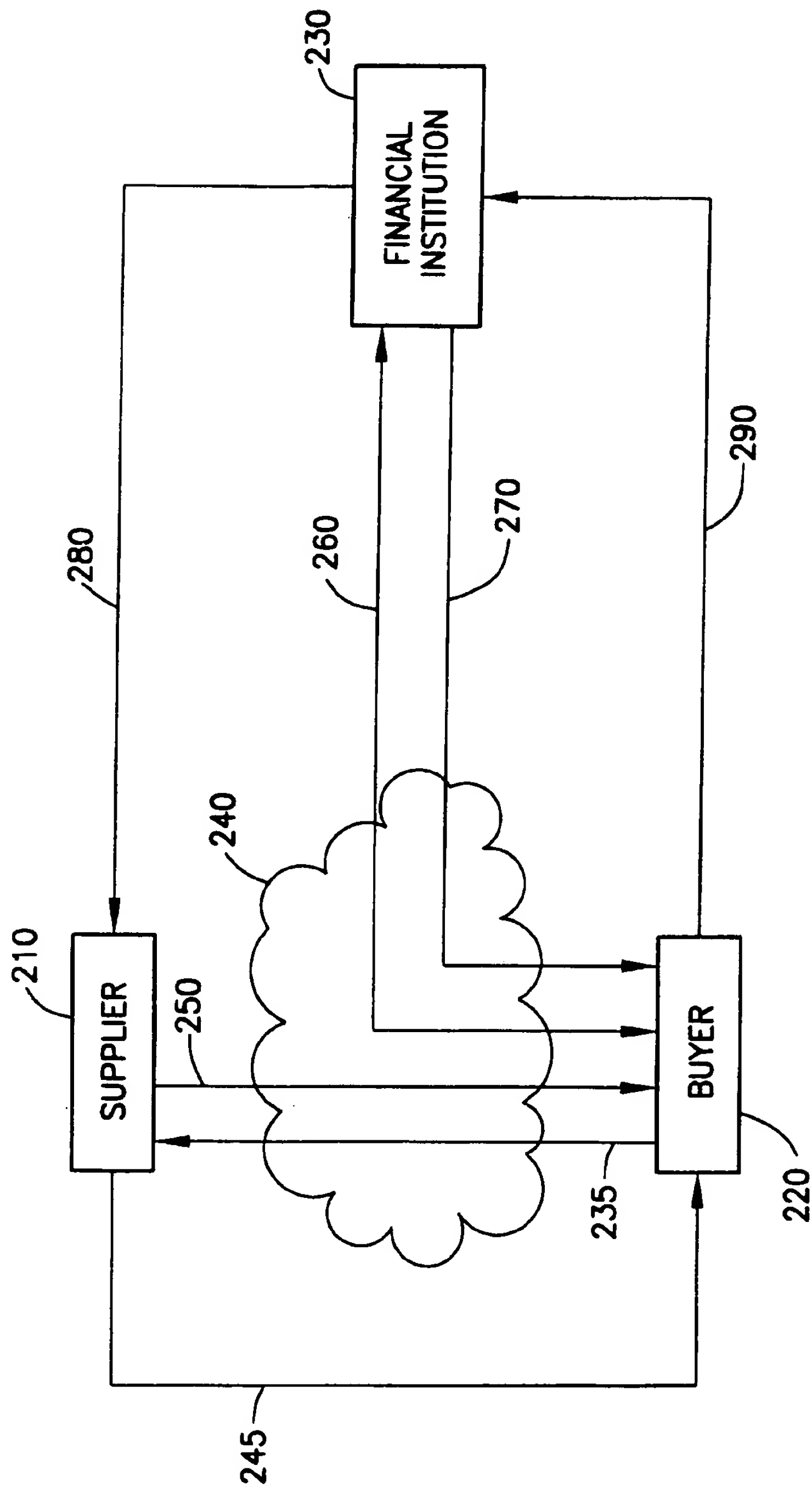


Fig. 2

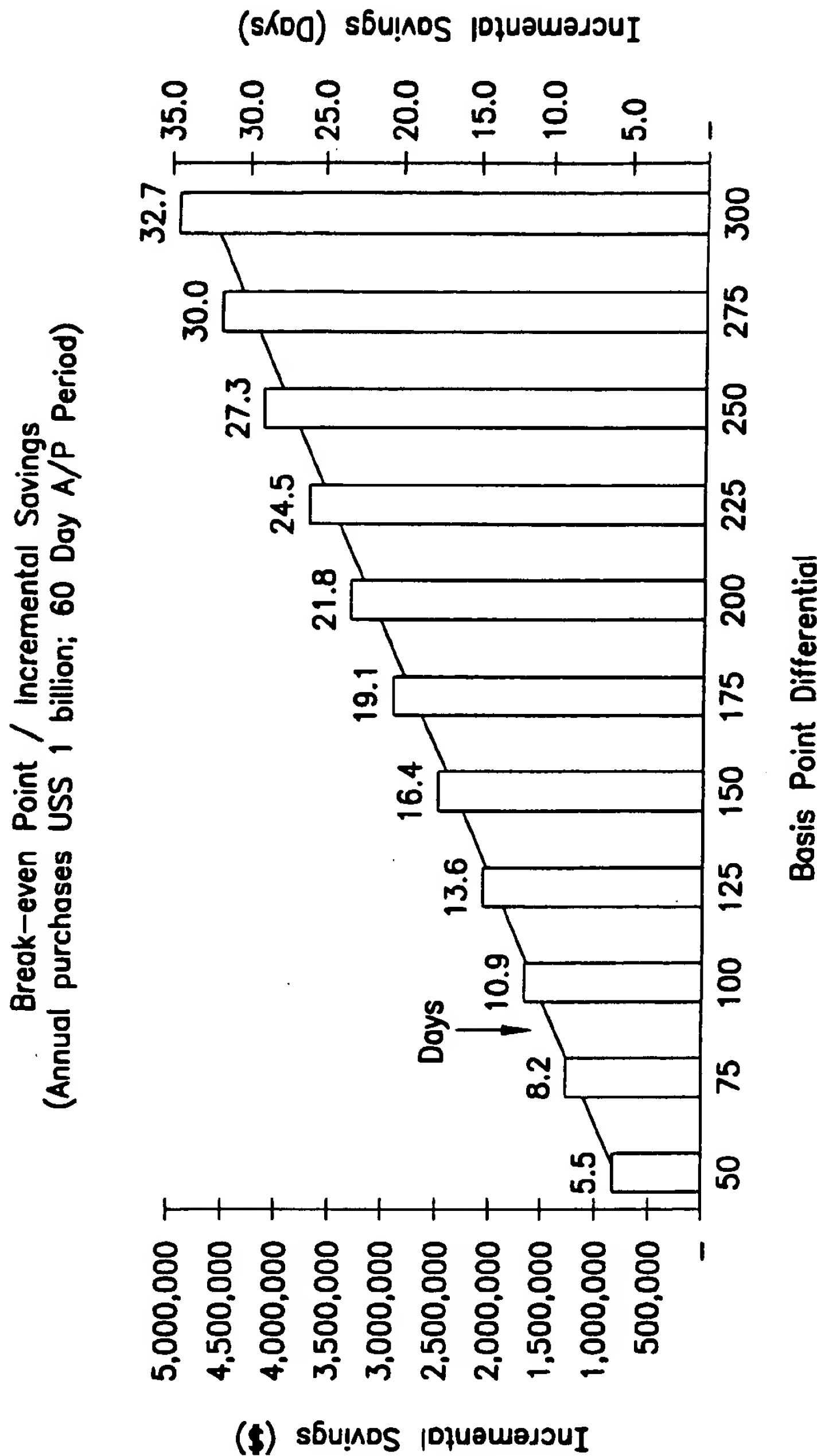


Fig. 3

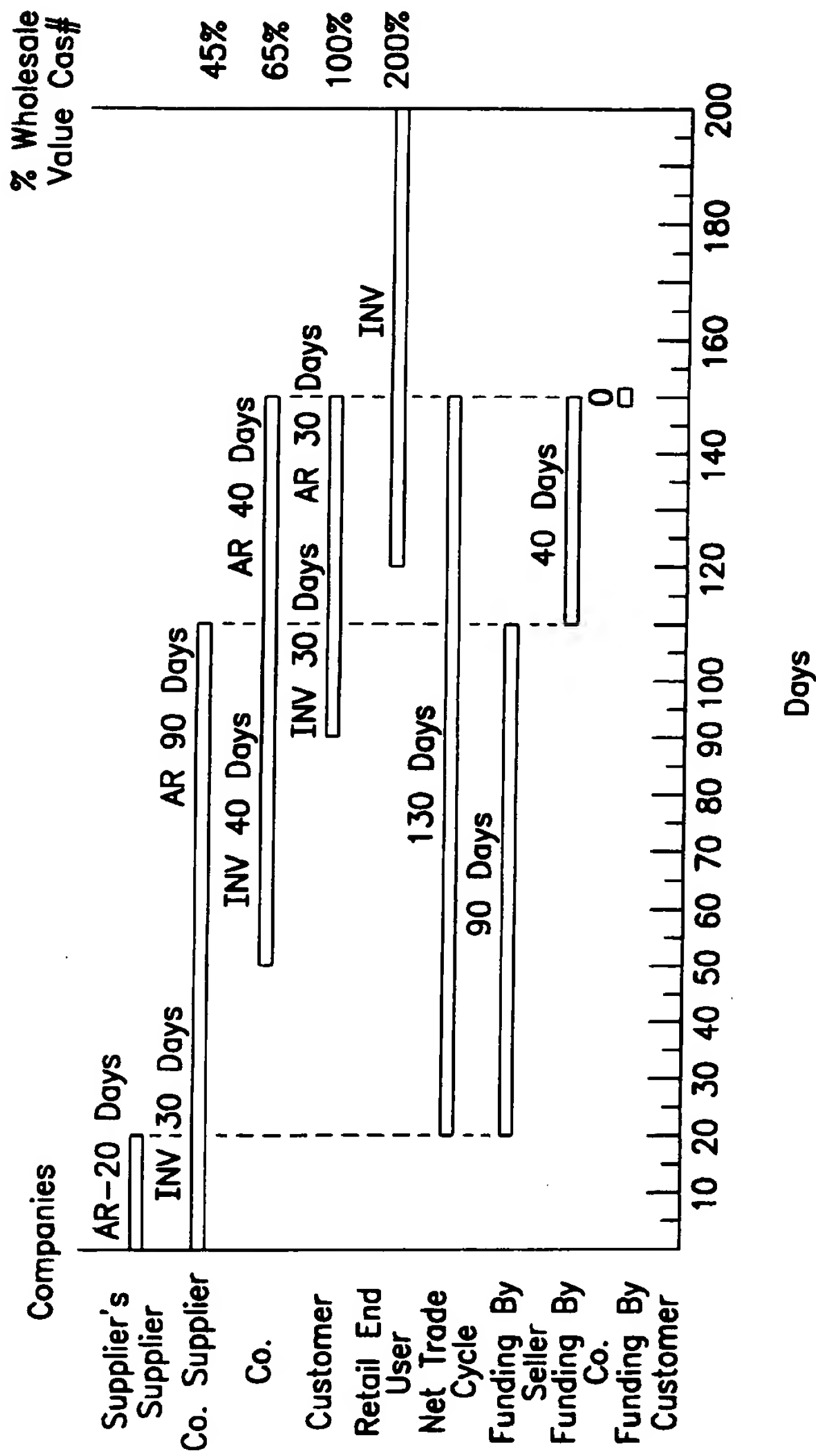


Fig. 4

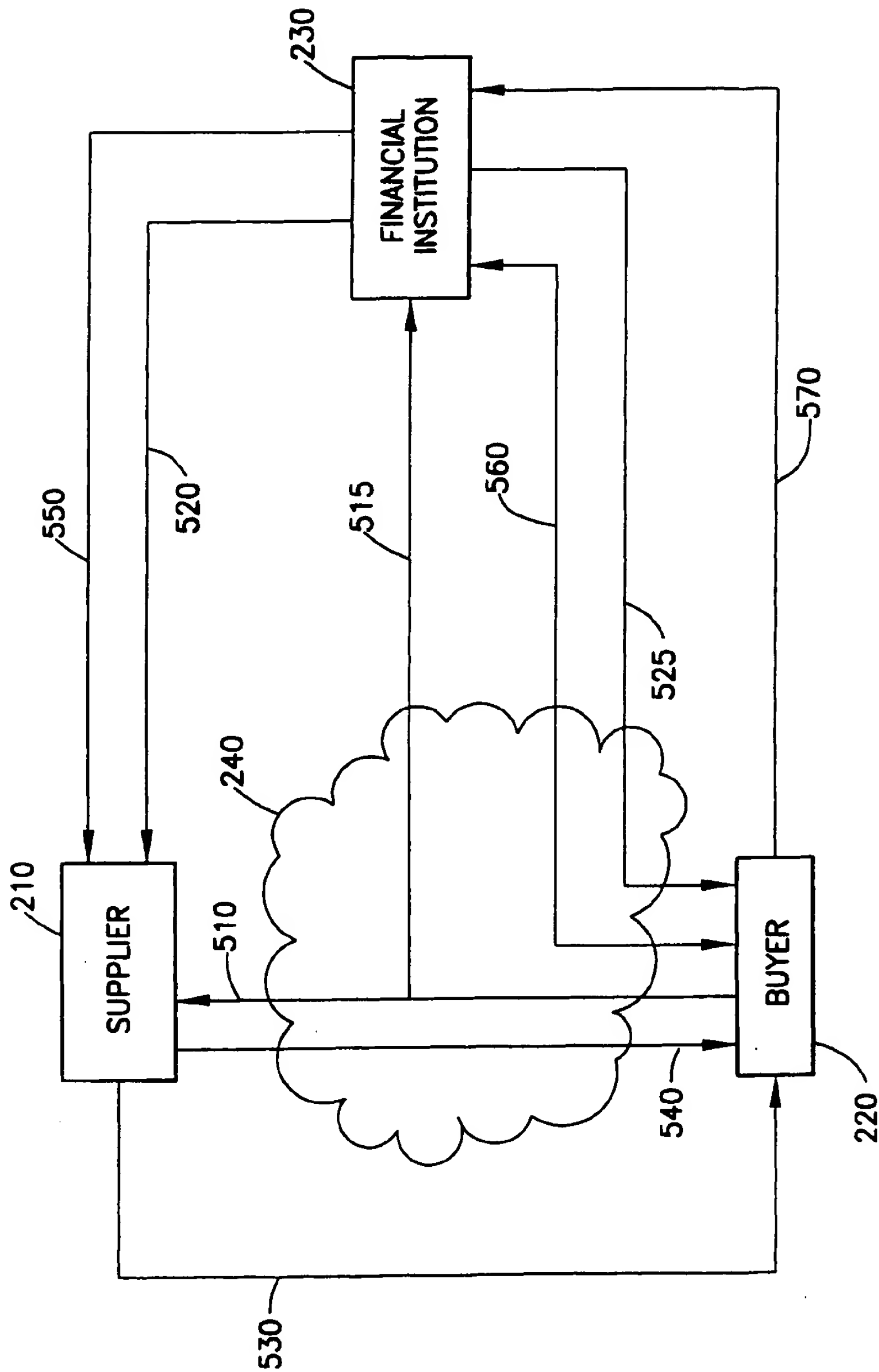


Fig. 5

## SUPPLY CHAIN FINANCING SYSTEM AND METHOD

### FIELD OF THE INVENTION

The present invention relates to financing systems and methods and more particularly to a system and method for financing a supply of goods in a supply chain.

### BACKGROUND OF THE INVENTION

Historically, working capital financing had been a one transaction process (from vendor to buyer, or supplier to customer) and usually involved only a single balance sheet or asset class. This method of capital financing is explained in connection with FIG. 1. FIG. 1 illustrates a traditional vertically integrated manufacturing processes. Raw materials 10 from a supplier were delivered to a factory 20 which produced finished goods 30 from the raw materials 10. From a financier's point of view, the only risk it had to understand was whether the manufacturer 20 could profitably transform the raw materials 10 into finished goods 30 that consumers wanted to and could afford to buy. Furthermore, this model only involves financing a single entity, the manufacturer 20.

In today's global economy, an intricate web of interdependent players make up the international supply system, requiring more sophisticated methods of coordination and finance. This complexity challenges the current methods and assumptions, making it more difficult for the financier to gauge the risk involved.

Furthermore, in the conventional supply chain financing, individual decisions are made at the enterprise level regarding the working capital finance structure to support operations. Each company in the supply chain has varying degrees of incentives to pay late and collect funds early, and to push as much inventory onto the balance sheets of its counterparties.

A combination of three emerging technologies has enabled the development of the present invention and its application to supply chain financing. These technologies are Supply Chain Management (SCM) techniques, electronic commerce (EC), and financial market technology. SCM has been defined as the management of flows, including materials, information, and money. Before SCM techniques were introduced, the size of buffer stocks maintained by a manufacturer or supplier were large, and even then, these buffer stocks often could not accommodate the peak seasonal requirements of customers. The introduction of SCM has smoothed out material flows, and this in itself has reduced the working capital expense associated with the high inventories of yesterday.

The second enabling technology that supports the development of the present invention is the transformation of electronic commerce (EC). While EC has been used for many years, start-up costs have been quite high, and many potential applications have therefore been excluded. With the development of company intranets and browser-based applications, new uses of business to business electronic commerce are burgeoning. Savvy financial institutions (e.g., banks) are migrating their information-based products from proprietary in-house developed software to browser-based intranet applications. Accordingly, these savvy institutions are now positioned to access their clients' supply chain data from their clients' electronic commerce and enterprise resource planning (ERP) systems in order to provide financing based on those data.

The third factor that permits the optimization of the present invention is the growth of investor appetite for

securities linked to specific cash flows. This form of investment is distinct from investments in securities linked to the risks and rewards of companies themselves, such as equity and debt securities.

In light of the problems associated with the conventional methods of supply chain financing, and in view of the emergence of the above described enabling technologies, it is an object of the present invention to reduce the finance costs associated with the supply chain and to free the movement of goods across the balance sheets of supply chain partners.

### SUMMARY OF THE INVENTION

The present invention, Supply Chain Finance (SCF), can be most easily thought of as "just in time money". It is the financial equivalent of materials planning "just in time" (JIT) and its benefits are very similar. Like JIT, the present invention seeks to eliminate inefficiencies that arise when trading partners do not coordinate their demand requirements.

In many cases, a supplier's cost of funds is greater than its buyer's cost of funds. The present invention enables the provision of financing to a supplier at the buyer's lower finance cost. The cost savings can be used to extend the buyer's days payable outstanding, resulting in an improvement in its Shareholder Value Added (SVA). In contrast to the prior art financial technique of factoring, the financing of the present invention is usually mandated by and arranged in conjunction with buyer—not the seller.

Furthermore, the financing of the present invention can be arranged without recourse to the seller, enabling off-balance sheet treatment for the seller. Thus, the SVA for both entities can be improved and the financing takes place at the lowest possible cost for both parties.

As described above, SCM techniques have been developed to coordinate complex supply chain interrelationships. However, one hidden cost of many SCM techniques has been to place greater reliance on suppliers to hold inventory. Many suppliers of United States companies, particularly those located in emerging market countries, have higher cost of funds than do their U.S. customers. The present invention eliminates this inefficiency by ensuring that the capital cost associated with the asset conversion cycle of any given supply chain is the lowest possible.

The present invention takes advantage of the new availability of low cost electronic commerce links between buyers and their financial institutions. These links are used by the institution to access the data contained in the buyer's enterprise resource planning (ERP) systems. With this data in hand, the institutions are able to evaluate, develop and offer highly structured financial products tailored to the clients' dynamic supply chain capital requirements.

### BRIEF DESCRIPTION OF THE DRAWINGS

For the purpose of illustrating the present invention, there is shown in the drawings a form which is presently preferred, it being understood, however, that the invention is not limited to the precise arrangement and instrumentality shown.

FIG. 1 illustrates the conventional vertically integrated manufacturing process;

FIG. 2 depicts an Accounts Payable Financing application in accordance with the present invention;

FIG. 3 is a graph illustrating the financial advantages of the use of the present invention;

FIG. 4 is a Trade Cycle Map illustrating the assets attributed to the participants in the supply chain; and

FIG. 5 depicts a Vendor Financing in accordance with the present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

One application of the present invention is Accounts Payable (AP) Financing which is illustrated in FIG. 2. As illustrated in this Figure, there are three entities involved in the essential features of the supply chain financing of the present invention, the supplier or vendor 210, the buyer 220 and the financial institution or advisor 230. In a preferred embodiment of the present invention, the financial institution 230 is a bank and the buyer 22 is a client of the bank.

Prior to actually implementing the present invention, the parties involved must evaluate the potential saving which can be expected from using the Supply Chain Financing of the present invention. This evaluation process typically begins with the buyer 220 hiring the financial advisor 230. The financial institution 230 uses the Trade Cycle Map (FIG. 4) the Supply Chain Financing Formula (described below) and data provided by the buyer 220 to determine whether the potential savings justify expense of proceeding.

The financial advisor 230 reviews the electronic commerce infrastructure among the buyer 220 and its trading partners 210. Although only a single trading partner 210 has been depicted in FIG. 2, the present invention is clearly applicable to multiple trading partners 210 of a buyer 220. In fact, once the setup for the present invention described below has been completed, the buyer will actually experience increased savings with the expansion of the supply chain financing to additional trading partners 210.

If the above evaluation determines that there is sufficient financial benefit, the bank 230 makes recommendations on the structure and implementation approach, taking into account the client's 220 relationships with its trading partners 210 and the client's other non-financial objectives. The financial advisor 230 conducts interviews with the trading partners 210 in order to validate the supply chain assumptions used above in the application of the Supply Chain Savings Formula and to understand other non-financial objectives and business values which may impact the implementation of the present invention. If the results of the interviews are all favorable, and the parties agree to proceed, there are several technical, administrative and legal processes which must be established.

The following set-up procedures are applicable to "true" Accounts Payable Financing in which the buyer accepts responsibility for the payment of the underlying merchandise. The buyer 220 in conjunction with the financial advisor 230 determine the advance financing rates which are applicable for each of the participating vendors 210. The applicable advance rates for each of the vendors 210 will vary depending of the particular circumstances of the vendor 210 and the relationship between the vendor 210 and the buyer 220. A vendor profile is then established for each vendor 210. The vendor profile includes, for example, the payment terms and advance rates established for the particular vendor. The vendor profile is used in the day-to-day processing involved in connection with the supply chain financing of the present invention.

From a legal standpoint, an agreement must be reached between the financial institution 230 and the client 220. One key provision of the agreement includes establishing the rules by which the financial institution can identify when the

client has accepted good from the supplier. Typically, the client 220 vouchers the supplier's invoice upon its acceptance of the goods. The rules established in the typical case would therefore indicate that a vouched invoice (or account payable) indicates that the buyer 220 has accepted the goods and payment is due to the supplier 210. The rules would additionally set forth the manner in which the financial institution 230 can properly identify vouched invoices. In conjunction with the acceptance rules, the client 220 agrees to pay the financial institution 230, acting on behalf of the seller 210, upon maturity of the underlying financing once the financial institution has acted upon a properly identified acceptance by the client 220 (e.g., a vouched invoice).

Additional provisions in the agreement between the client 220 and the financial institution 230 are: an agreement as to the method and form for resolving post acceptance disputes (usually in the form of a put to the client 220 of the underlying asset); and establishment of reliance on the selected method of communication (this will typically place no liability on the part of financial advisor 230 to advance funds in the event of communications/software failure).

Having resolved the legal issues, the process turns to addressing the technical issues of implementing the present invention. The main technical requirement of the present invention is the establishment by the financial institution 230 and the client 220 of extra/intra/internet dial-up and logon access by the bank 230 to the client's 220 electronic commerce and enterprise resource planning (ERP) systems such as the client's account payable system. In general, most buyers 220 will already have electronic accounting and management systems in place and the above process is merely a matter of providing electronic access to these systems by the financial institution 230. Of course, all of the appropriate security measures for the provision of this access (e.g., passwords . . . ) should be put in place.

Once all of the above described evaluation and setup has been completed, the parties are ready for the actual implementation of the financing. In the Accounts Payable example depicted in FIG. 2, the buyer 220 desires to purchase goods from the supplier 210. To initiate the purchase, the buyer issues a request for goods, e.g., a Purchase Order (PO) in step 235 of the process. In a preferred embodiment, the PO 235 is issued from the buyer 220 to the supplier 210 through an electronic link 240 such as the internet or other electronic data interface. Alternatively, the PO 235 can be issued through traditional mail, voice or facsimile channels, although these methods will inherently slow the process, be less reliable and less conducive to tracking and verification. Regardless of the method of transmittal of the PO 235, the buyer 220 updates its ERP system to reflect the issuance and terms of the PO 235.

In response to its receipt of the PO 235, the supplier 210 ships 245 the goods to the buyer 220 in anticipation of being paid (to be discussed below). In conjunction with shipping 245 the goods, the supplier 210 also transmits 250 invoice data to the buyer 220. Again, in a preferred embodiment, the invoice is sent 250 to the buyer 220 over the electronic link 240, but can be transmitted manually (by mail, voice or facsimile). Alternatively, the shipment 245 of the goods (transfer of title/risk) can be established through the buyer's 220 receipt of the goods at one of its facilities (e.g., through dock or warehouse receipts).

Regardless of the method by which the shipment 245 of the goods is verified, the buyer 220 updates its ERP system to reflect the receipt of the goods. The buyer 220 then matches the delivery/invoice data to the PO data correspond-



ing to the delivery. If the acknowledgement data does not meet the buyer's 220 payment rules, then adjudication is required between the client 220 and the vendor 210 in order to determine the value, if any, of shipped goods which are eligible for financing. If the acknowledgement data meets the client's 220 payment rules, then the buyer 220 may deduct any credits due the buyer 220. Once the validity of the invoice data has been established, the buyer 220 indicates its acceptance of the goods in accordance the manner established by the rules between the buyer 220 and the financial institution 230. In the preferred embodiment of the present invention, the buyer 220 vouchers the account payable (AP) in its ERP system. The voucher must include the payment aging of the individual payment for the particular shipment in question.

In an additional embodiment of the present invention, the financial institution 230 itself performs the back office operation of vouchering the accounts payable for the client 220. In this embodiment, the financial institution 230 has access to the Purchase Order data and the systems used by the client 220 normally used to verify the acceptance of the goods (e.g., reports detailing the physical inspection, quantity, quality . . . of the received goods). In this embodiment, the agreement between the client 220 and the financial institution must carefully delineate the rules governing the process which the financial institution 230 must follow in accepting the goods. This is critical, because, as described below, the acceptance of the goods is the trigger for the financial institution to calculate the financing applicable to the goods and for the forwarding of payment to the supplier.

Returning to the normal AP financing processing, once the verified and vouchered AP has been updated in the client's 220 ERP system, the bank 230 is able to log onto the client's 220 intra/internet server and extract 260 a file containing the daily AP vouchers. In processing the AP vouchers, the financial institution 230 first discards vouchered AP's that do not match established vendor profiles (i.e., vendor for whom supply chain financing has not been set up). The bank 230 then maps vouchered AP's against the vendor profile associated with the vendor 210 which shipped the goods reflected by the vouchered AP. Using the vendor profile, the financial institution 230 calculates the advance rate applicable to financing of the particular transaction. The bank 230 then performs a discount to yield calculation with respect to the value date to maturity based on the advance rate data. This calculation yields the net proceeds which the bank 230 will pay to the supplier 210. The bank 230 then calculates a payment fee (if any), creates an electronic payment file for the net proceeds less payment fee (if any), and sends the payment file to the bank's 230 payment system.

Once the payment file has been created, the bank 230 sends 270 a payment notice to the buyer 220. The payment notice includes the client's 220 reference data (typically the PO number). Upon receipt of the payment notice, the buyer 220 confirms the payment(s) and maturities. In the event there is a discrepancy between the client's 220 AP/ERP system and the bank's 230 payment notice, manual resolution of difference is required. Upon approval of the payment notice and/or resolution of any discrepancies, the bank 230 pays 280 the supplier 210. Alternatively, the bank 230 can pay the supplier 210 simultaneously with its notification to the buyer 220. In this embodiment, the above described agreement between the buyer 220 and the bank 230 governs any dispute as to discrepancies with respect to the payment made by the bank 230 to the supplier 210. In a preferred embodiment, the payment 280 to the supplier 210 is accomplished via Electronic Funds Transfer (EFT).

To close the financing loop, on maturity (the agreeing date), the client 220 remits 290 the gross proceeds to bank, which settles the transaction.

The AP Financing described above in connection with FIG. 2 can work well to improve a buyer's 220 SVA by carefully matching the interest cost savings generated to create additional days payable outstanding for the buyer 220. On the other hand, it can be used more aggressively, as an incentive or quid pro quo for a supplier 210 to accept lower sales prices to its customer/buyer 220. The power of this relatively simple structure can be seen in FIG. 3.

The chart depicted in FIG. 3 shows the number of additional days outstanding (and their dollar value at the current LIBOR rate) based on the number of basis points (a basis point is 1/100 of 1%) difference between the buyer's 220 and the seller's 210 cost of funds. LIBOR is the London Interbank Offer Rate, the most widely used rate for funding bank loans to large corporations which is currently about 5.625%. As an example of the use of the chart depicted in FIG. 3, if the buyer's 220 cost of funds is 200 basis points less than the seller's 210, and the current payment terms are 60 days, then through the AP structure of the present invention, the buyer 220 could receive an additional 21.8 days of terms from the seller 210 at no additional receivable carrying cost to the seller 210.

The example of AP Financing given above has broad applications. By neutralizing the impact of working capital cost across the supply chain, it can encourage experimentation with various JIT initiatives. The example above shows how SCF of the present invention can help trading partners create more flexible payment arrangements to meet SVA goals. Other SCF structures can help managers optimize the physical location of materials without imposing a financing penalty on one partner. Other structures can facilitate the funding of overseas partners facing dramatically higher funding costs.

One step in the process of the present invention briefly described above is evaluating whether the process will be financially beneficial. The first step in evaluating whether or not SCF would provide any benefit to a particular supply chain is to do a quick assessment of the net trade cycle of each individual company within the supply chain in order to determine the dollar value of the potential saving. A simple example of a Trade Cycle Map is shown in FIG. 4. In this case, the supply chain being mapped includes a primary supplier and a single customer, and takes into account the supplier's supplier and the customer's customer, the retail end-user.

The Trade Cycle Map shows the assets attributed to the supply chain for each participant—inventory and accounts receivable. The payable period is the accounts receivable period of the supplier. The chart also shows the percentage of the Wholesale Value Chain, which is used as a factor in order to calculate the potential savings of SCF. The chart can be used to derive the net trade cycle of each participant and, more importantly, the supply chain as a whole.

In this example, the Net Trade Cycle of the defined supply chain is 130 days—the time from when "Supplier" pays "Supplier's Supplier" to the time when "Co." is paid by "Customer". Another way to express this is that the supply chain "turns" 2.8 times per year. It is observed that in this example "Supplier" bears the greatest burden of financing this particular supply chain, 90 of the 130 days or about 70%, whereas "Co." pays about 30% and "Customer" has no direct finance cost, having matched the timing of its receivable with the payment of "Co's" invoice.

The mismatched payment terms in this example are intended to portray the typical historical relationships between buyer and seller over time, and the relative power one has over the other. The challenge foremost to corporate treasurers is to ensure that a company's business mix reflects an overall balance of trading terms so that overall, payables fund much of inventory and some receivables, if possible. However, trade cycles do not get a great deal of attention at the supply chain level, especially if they are being managed well overall at the corporate or division level.

As an illustration of the benefits of the present invention, the following assigns credit costs to each of the players in the example depicted in FIG. 4. Assume "Supplier", who is financing 90 out of the 130 net trade cycle days, is a Korean manufacturer. "Co." is a large middle market manufacturer and distribution company. And further assume that "Customer" is a leading consumer electronics retailer with a top credit rating. The marginal funding costs of each of these entities is as depicted in Table 1.

TABLE 1

Company	Marginal Funding Cost
Korean Manufacturer ("Supplier")	LIBOR + 6.5%
USA Middle Market Manufacturer ("Co.")	LIBOR + 2.5%
Strong Retailer ("Customer")	LIBOR + 0%

The potential supply chain savings can be derived from the following Supply Chain Financing Formula:

$$V = \sum_{i=1}^n P_i * (d_i / t) (\Delta_i - D)$$

Where V is the dollar amount of annual wholesale value chain; n is number of participants, P is the percentage of annual value chain contributed by each participant; d is number of days each participant finances the value chain; t is net trade cycle of supply chain, Δ is the LIBOR spread of each participant; and D is the LIBOR spread of lowest funding cost supply chain participant.

If \$100 million wholesale value is assigned to the example above, the total potential supply chain finance cost savings in this example is therefore \$2,525,000 (2.5%). It is this amount that would be shared among the supply chain participants and the investors, according to the performance risks inherent in the transaction and how the financing would be structured.

FIG. 5 illustrates an alternative embodiment of the present invention. Although this embodiment also uses the Account Payable as the trigger for the financing, in contrast to the previous embodiment, where the buyer assumed full risk, in the present embodiment the seller is advanced a payment prior to shipment of the goods and the buyer has recourse against the supplier for at least part of the advance. This embodiment is known as Vendor Financing.

The evaluation process for Vendor Financing is the same as described above with respect to the AP Financing depicted in FIG. 2. The three entities depicted in FIG. 5, the buyer 220, the supplier 210 and the financial institution 230 are the same as those depicted in FIG. 2. The set-up process for Vendor Financing is slightly different from that described above. In determining the Advance rates which are applicable to the participating suppliers 210, the bank 230 will

determine two Advance Rates, one for pre-shipment advances against Purchase Orders and one for post-shipment advances against Accounts Payable. Furthermore, the bank 230 will determine the total amount of final credit that may be taken by the buyer 220 following shipment, against any single payment and a maximum dollar limitation for same.

As with the AP financing described above, an agreement between the buyer 220 and the bank 230 must be reached. Again, a key provision for a Vendor Financing agreement includes establishing the rules by which the financial institution can identify when the client 220 has accepted good from the supplier 210, as previously described above. Other provisions for a Vendor Financing agreement include: the amount and form of recourse to buyer 220 for pre-shipment advances; an agreement by the client 220 to pay the financial institution upon maturity of the underlying item; procedures for the resolution of post acceptance disputes (usually in the form of a put to the client of the underlying asset); procedures for the resolution of pre-acceptance disputes; and establishment of reliance on the selected method of communication (this will typically place no liability on the part of financial advisor 230 to advance funds in the event of communications/software failure).

In addition to an agreement between the bank 230 and the buyer 220 for Vendor Financing, an agreement between the bank 230 and supplier(s) 210 is also required. The key provisions of this agreement between the bank 230 and supplier(s) 210 include: secondary recourse provisions, if any; procedures for the resolution of pre-acceptance disputes; and hold harmless clauses in which no liability on the part of financial advisor 230 to advance funds in the event of communication/software failure.

As in the AP financing, the final technical step is for the financial institution to obtain extra/intra/internet dial-up and logon access to the ERP system of the buyer 220.

The actual financing process for Vendor financing will be described in connection with FIG. 5. As with AP financing, the process starts by the client 220 manually or via electronic link sending 510 a request for goods (e.g., a Purchase Order) to the vendor 210. The fact of the transmission and the contents of the PO are updated in client's ERP system. In parallel with the transmission of the PO to the vendor 210, the PO is also sent 515 to the financial institution 230. This transmission can either be initiated by the buyer 220 or by prearranged and/or regularly scheduled download by the bank 230. In the preferred embodiment, this download occurs via the electronic interface between the bank 230 and the buyer 220.

At the bank 230, the PO data are matched against Vendor Profile. The bank 230 calculates a pre-shipment advance rate applicable to the transaction represented by the PO and runs a discount to yield calculation on value date to estimated settlement date based on the above calculated advance rate. This calculation determines the advance proceeds which will be forwarded to the supplier 210. The financial institution then calculates payment fee, if any, and creates an electronic payment file for the advanced proceeds less the payment fee, if any.

At this point, the advanced proceeds are transferred 520 from the bank 230 to the supplier 210, preferably through Electronic Funds Transfer. The bank 230, in conjunction with the funds transfer, also sends 525 a payment notification to the client 220 which references the client's reference data (typically the PO number). The payment notice confirms the payment(s) to the supplier 210 and also confirms the estimated maturities. This process is slightly different

from the process described above with respect to the AP financing in that the funds were sent 520 prior to notifying 525 the buyer 220. Either procedure is acceptable and can be used in either process.

In step 530 the vendor 210 ships the merchandise to the buyer 220. Acknowledgement of merchandise shipment (transfer of title) can be made by one of three ways: via the client's 220 receipt of the goods (as evidenced by a dock or warehouse receipt); via an invoice transmitted 540 by electronic means from the vendor 210 to the buyer 220; or via an invoice in hardcopy form from the vendor 210 to the buyer 230.

Regardless of the method by which the shipment 530 of the goods is acknowledged, the buyer 220 updates its ERP system to reflect the receipt of the goods. The buyer 220 then matches the delivery/invoice data to the PO data corresponding to the delivery. If the acknowledgement data does not meet the buyer's 220 payment rules, then adjudication is required between the client 220 and the vendor 210 in order to determine the value of shipped goods which are ineligible for additional financing. The bank 230 may invoke the recourse provisions of the agreement and have the underlying assets removed from funding.

If the acknowledgement data meets the client's 220 payment rules, then the buyer 220 may deduct any credits due the buyer 220 up to the agreed upon percentage and within the total dollar limitation as set forth in the agreements. Once the validity of the invoice data has been established, the buyer 220 indicates its acceptance of the goods in accordance the manner established by the rules between the buyer 220 and the financial institution 230. Again, as described above with respect to the AP financing embodiment, in the preferred embodiment of the present invention, the buyer 220 vouchers the account payable (AP) in its ERP system. The voucher must include the payment aging of the individual payment for the particular shipment in question.

Once the verified and vouchered AP has been updated in the client's 220 ERP system, the bank 230 is able to log onto the client's 220 intra/internet server and extract 560 a file containing the daily AP vouchers. In processing the AP vouchers, the financial institution 230 first discards vouchered AP's that do not match established vendor profiles (i.e., vendor for whom supply chain financing has not been set up). The bank 230 then maps vouchered AP's against the vendor profile associated with the vendor 210 which shipped the goods reflected by the vouchered AP. Using the vendor profile, the financial institution 230 calculates the advance rate applicable to financing of the particular transaction.

In contrast to the AP financing previously described, the bank 230 then adjusts the discount to yield substituting a final correct settlement date (when the first advance was made, the final settlement date was not fixed) The final settlement date is the date represented by the client's ageing or other rule based date. The financial institution 230 then calculates the discount to yield on the remaining unfunded balance of the shipment value in order to determine the net proceeds which the bank 230 will pay to the supplier 210. The bank 230 then calculates a payment fee (if any), creates an electronic payment file for the net proceeds less payment fee (if any), and sends 550 the payment via EFT to the supplier 210.

Once the net proceed payment has been made 550 to the supplier 210, the bank 230 sends 560 a further payment notice to the buyer 220. The payment notice again includes

the client's 220 reference data. Upon receipt of the payment notice, the buyer 220 confirms the payment(s) and maturities. In the event there is a discrepancy between the client's 220 AP/ERP system and the bank's 230 payment notice, manual resolution of difference is required.

To close the Vendor Financing loop, on maturity (the ageing date), the client 220 remits 570 the gross proceeds to bank, which settles the transaction.

Although the present invention has been described in relation to particular embodiments thereof, many other variations and modifications and other uses will become apparent to those skilled in the art. It is preferred, therefore, that the present invention be limited not by the specific disclosure herein, but only the gist and scope of the disclosure.

What is claimed:

1. A method for financing, through a third party, a supply of goods from a supply chain to a buyer, the supply chain consisting of a number of participants, wherein the buyer and each participant in the supply chain have a cost of financing, the method comprising the steps of:

identifying a first participant that has a cost of financing that is the greatest above the buyer's cost of financing;

establishing rules between the buyer and the third party including establishing, in a first rule, a manner in which the third party can identify acceptance data representing acceptance of goods by the buyer;

the third party identifying acceptance data related to goods accepted by the buyer;

calculating the financing for the goods in response to the identified acceptance data and in response to the established rules;

forwarding payment for the goods from the third party to the first participant prior to a time the payment for the goods would normally be payable; and

at maturity of the financing, settling the financing between the buyer and the third party.

2. The method as set forth in claim 1, wherein the calculating step comprises the steps of:

determining an advance rate;

performing a discount to yield calculation with respect to a value date to maturity in response to the advance rate; and

determining net proceeds in response to the discount to yield calculation, wherein the net proceeds are the payment forwarded to the one participant.

3. The method as set forth in claim 1, further comprising the step of establishing a supplier profile containing advance rates and payment terms applicable to the first participant.

4. The method as set forth in claim 1, wherein the first rule includes an agreement by the buyer to repay payments made by the third party to the first participant in reliance on properly identified acceptance data.

5. The method as set forth in claim 1, wherein the acceptance data is generated by the financial institution by performing an account payable vouchering process for the buyer.

6. The method as set forth in claim 1, further comprising the steps of:

generating a request for the goods by the buyer;

transmitting the request to the supply chain; and

shipping the goods from the supply chain to the buyer; wherein the invoice data is generated by the supply chain and transmitted to the buyer, the invoice data is cap-



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tured in a buyer's database, and wherein the invoice data is received by the third party from the buyer's database.

7. A method for financing, through a third party, a supply of goods from a supply chain to a buyer, the method comprising the steps of:

establishing rules between the buyer and the third party including establishing, in a first rule, a manner in which the third party can identify acceptance data representing acceptance of goods by the buyer;

the third party identifying acceptance data related to goods accepted by the buyer;

evaluating the savings to be obtained by the financing, wherein the evaluating step is accomplished using the formula:

$$V = \sum_{i=1}^n P_i * (d_i / t) (\Delta_i - D)$$

where V is the dollar amount of annual wholesale value of the supply chain; n is the number of participants in the supply chain, P is the percentage of annual wholesale value of the supply chain contributed by each participant; d is number of days each participant finances the wholesale value of the supply chain; t is net trade cycle of the supply chain, Δ is the LIBOR spread of each participant; and D is the LIBOR spread of the lowest funding cost supply chain participant;

calculating the financing for the goods in response to the identified acceptance data and in response to the established rules;

forwarding payment for the goods from the third party to one of the participants in the supply chain prior to a time the payment for the goods would normally be payable; and

at maturity of the financing, settling the financing between the buyer and the third party.

8. A method for financing, through a third party, a supply of goods from a supply chain to a buyer, the supply chain consisting of a number of participants, the method comprising the steps of:

generating request data representing a request for the goods;

receiving the request data by at least one of the participants in the supply chain and the third party;

calculating financing for the requested goods in response to the received request data;

forwarding a first payment for the goods from the third party to the at least one participant;

shipping the goods;

generating invoice data representing the shipment of the goods;

receiving invoice data by the third party representing the shipment of goods;

calculating a remaining payment, if any, with respect to the shipped goods in response to the received invoice data and in response to the first payment;

forwarding the remaining payment, if any, from the third party to the at least one participant; and

at maturity of the financing, settling the financing between the buyer and the third party.

9. The method as set forth in claim 8, wherein the financing is calculated using an advance rate and wherein the remaining payment is calculated at a final rate.

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10. The method as set forth in claim 9, wherein advance rate and the final rate are different.

11. The method as set forth in claim 8, further comprising the steps of:

prior to calculating the financing for the goods, evaluating the savings to be obtained by the financing.

12. The method as set forth in claim 11, further comprising the step of performing the steps of claim 12 with respect to the participant in the supply chain in which the evaluated savings obtained by the financing is the greatest.

13. The method as set forth in claim 8, wherein the step of calculating the financing comprises the steps of:

determining an advance rate;

performing a discount to yield calculation with respect to a value date to maturity in response to the advance rate; and

determining net proceeds in response to the discount to yield calculation, wherein the net proceeds are the first payment forwarded to the at least one participant.

14. The method as set forth in claim 13, wherein the value date to maturity is an estimated value date to maturity.

15. The method as set forth in claim 8, further comprising the step of:

notifying the buyer of the first payment to the at least one participant.

16. The method as set forth in claim 8, further comprising the steps of:

establishing a supplier profile containing a pre-shipment advance rate applicable to financing prior to shipment of the goods and a post-shipment advance rate applicable to financing after shipment of the goods.

17. The method as set forth in claim 16, wherein the step of determining the advance rate comprises retrieving the advance rate from the supplier profile.

18. The method as set forth in claim 8, further comprising the steps of:

determining an amount of final financing available to buyer following shipment of the goods; and

determining a maximum dollar limit of the final financing.

19. The method as set forth in claim 8, wherein the third party is a bank.

20. The method as set forth in claim 8, wherein the buyer has recourse against the at least one participant at least with respect to the first payment.

21. The method as set forth in claim 8, wherein at least the first payment is made to the at least one participant by an electronic medium.

22. The method as set forth in claim 8, wherein the request data is a purchase order.

23. The method as set forth in claim 8, wherein the invoice data is generated in response to a receipt of the goods by the buyer.

24. A method for financing, through a third party, a supply of goods from a supply chain to a buyer, the supply chain consisting of a number of participants, wherein the buyer and each participant in the supply chain has a cost of financing, the method comprising the steps of:

generating request data representing a request for the goods;

receiving the request data by at least one of the participants in the supply chain and the third party;

evaluating the savings to be obtained by the financing, wherein the evaluating step is accomplished using the formula:

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$$V = \sum_{i=1}^n P_i * (d_i / t) (\Delta_i - D)$$

where V is the dollar amount of annual wholesale value of the supply chain; n is the number of participants in the supply chain, P is the percentage of annual whole-sale value of the supply chain contributed by each participant; d is number of days each participant finances the wholesale value of the supply chain; t is net trade cycle of the supply chain, Δ is the LIBOR spread of each participant; and D is the LIBOR spread of the lowest funding cost supply chain participants;  
calculating financing for the requested goods in response to the received request data;

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forwarding a first payment for the goods from the third party to the first participant;  
shipping the goods;  
generating invoice data representing the shipment of the goods;  
receiving invoice data by the third party representing the shipment of goods;  
calculating a remaining payment if any, with respect to the shipped goods in response to the received invoice data and in response to the first payment;  
forwarding the remaining payment, if any, from the third party to the first participant; and  
at maturity of the financing, settling the financing between the buyer and the third party.

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(54) **METHODS AND INVESTMENT  
INSTRUMENTS FOR PERFORMING TAX-  
DEFERRED REAL ESTATE EXCHANGES**

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*Primary Examiner*—Vincent Millin

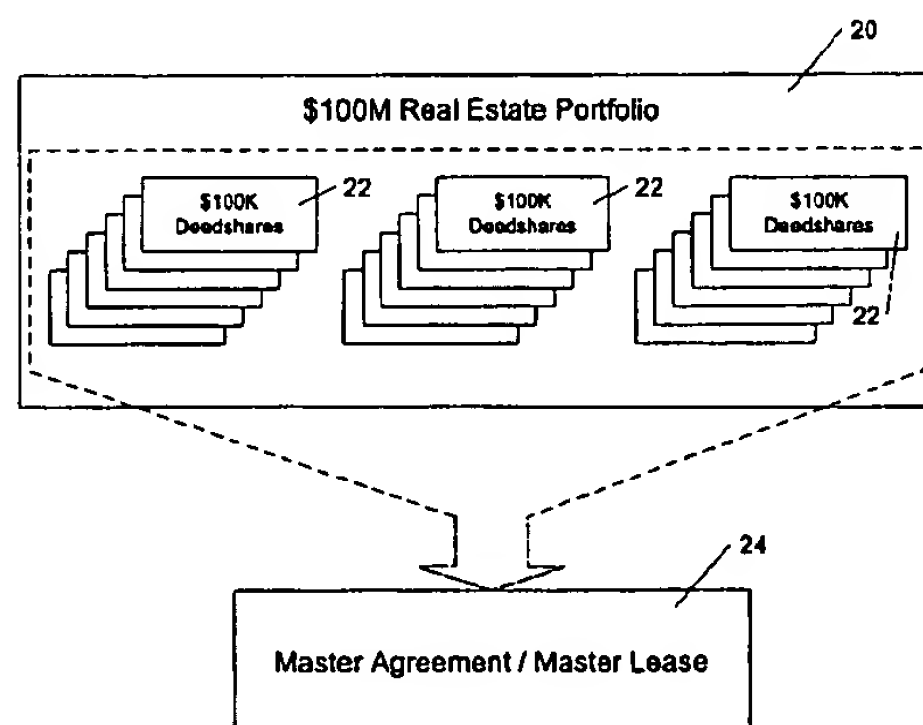
*Assistant Examiner*—Pedro Kanof

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Pisano

(57) **ABSTRACT**

Methods and investment instruments for investing in real  
estate are described wherein a portfolio of investment real  
estate is divided into a plurality of tenant-in-common deeds  
of predetermined denominations, and which are subject to a  
master agreement and master lease to form "deedshares."  
Holders of the deedshares receive a guaranteed income  
stream from the master lease and yearly depreciation, with-  
out having to maintain or manage the real estate. The holders  
of deedshares are subject, under the master agreement, to a  
mechanism that enables the master tenant to purchase, or  
arrange for the purchase of the deedshares at fair market  
value (or some other calculable value) at the end of a  
specified term. Because the deedshares qualify as interests in  
investment real estate, they are eligible for tax-deferred  
treatment under §1031 of the Internal Revenue Code.

**41 Claims, 5 Drawing Sheets**





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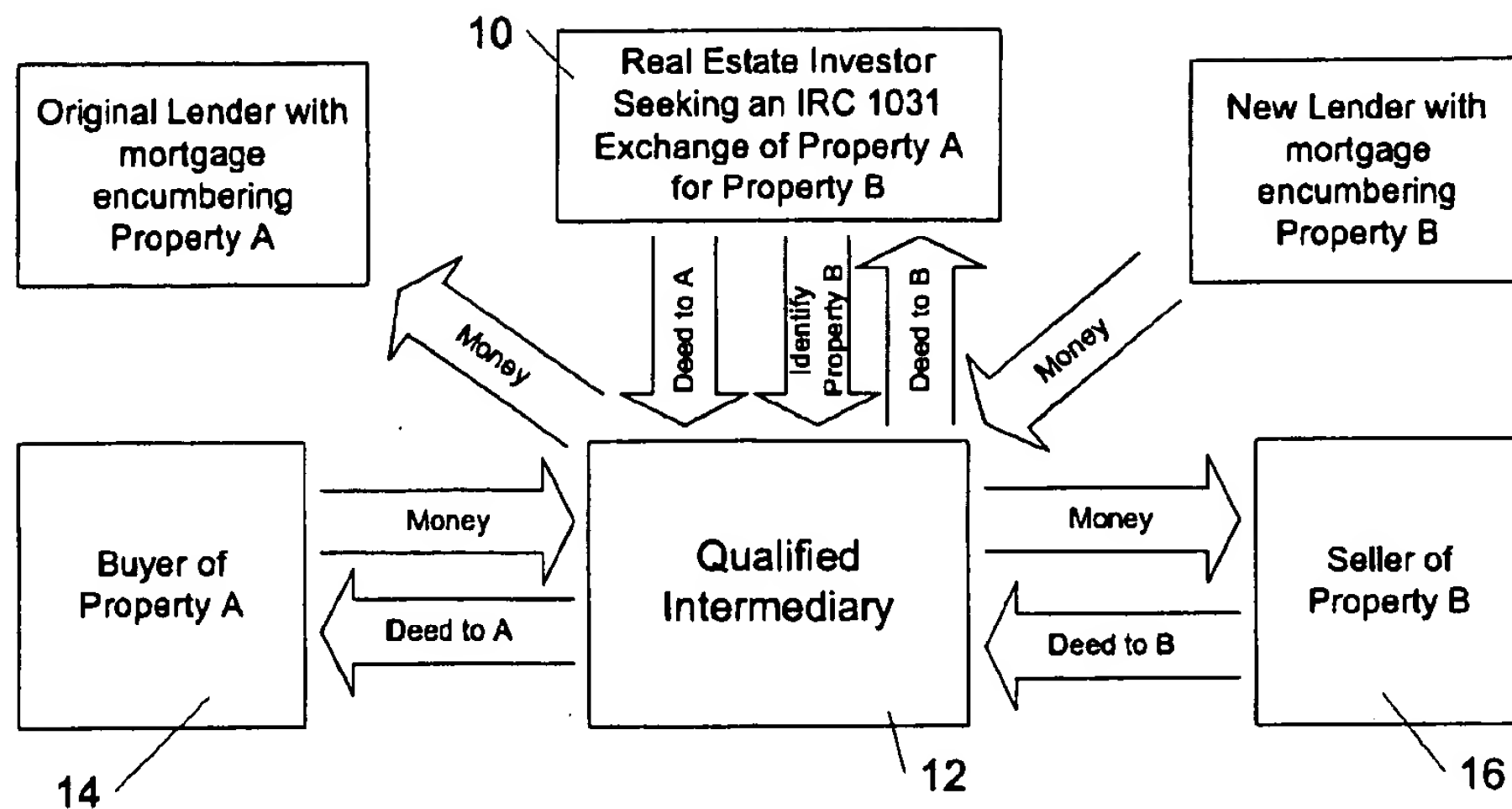


FIG. 1 (Prior Art)

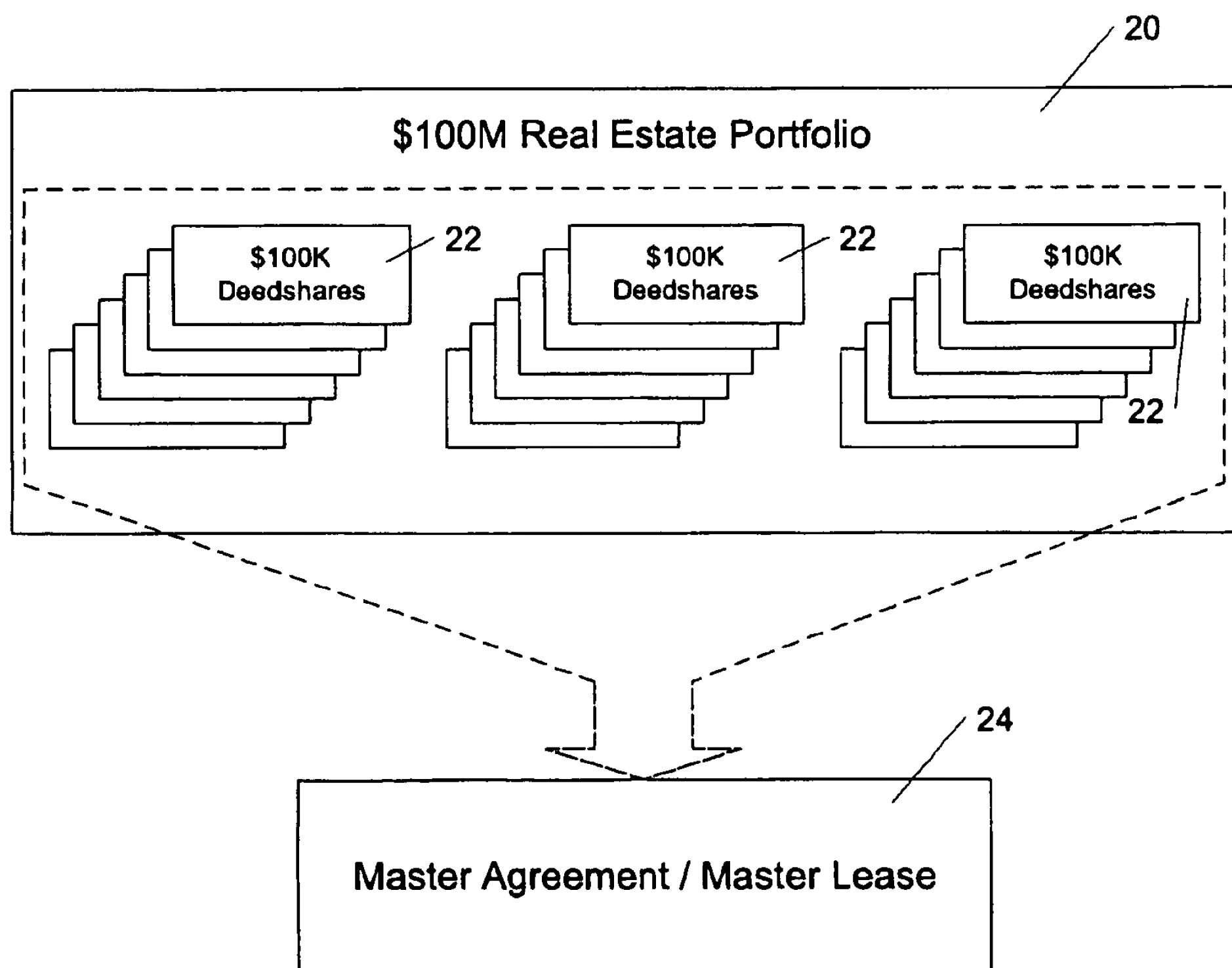


FIG. 2

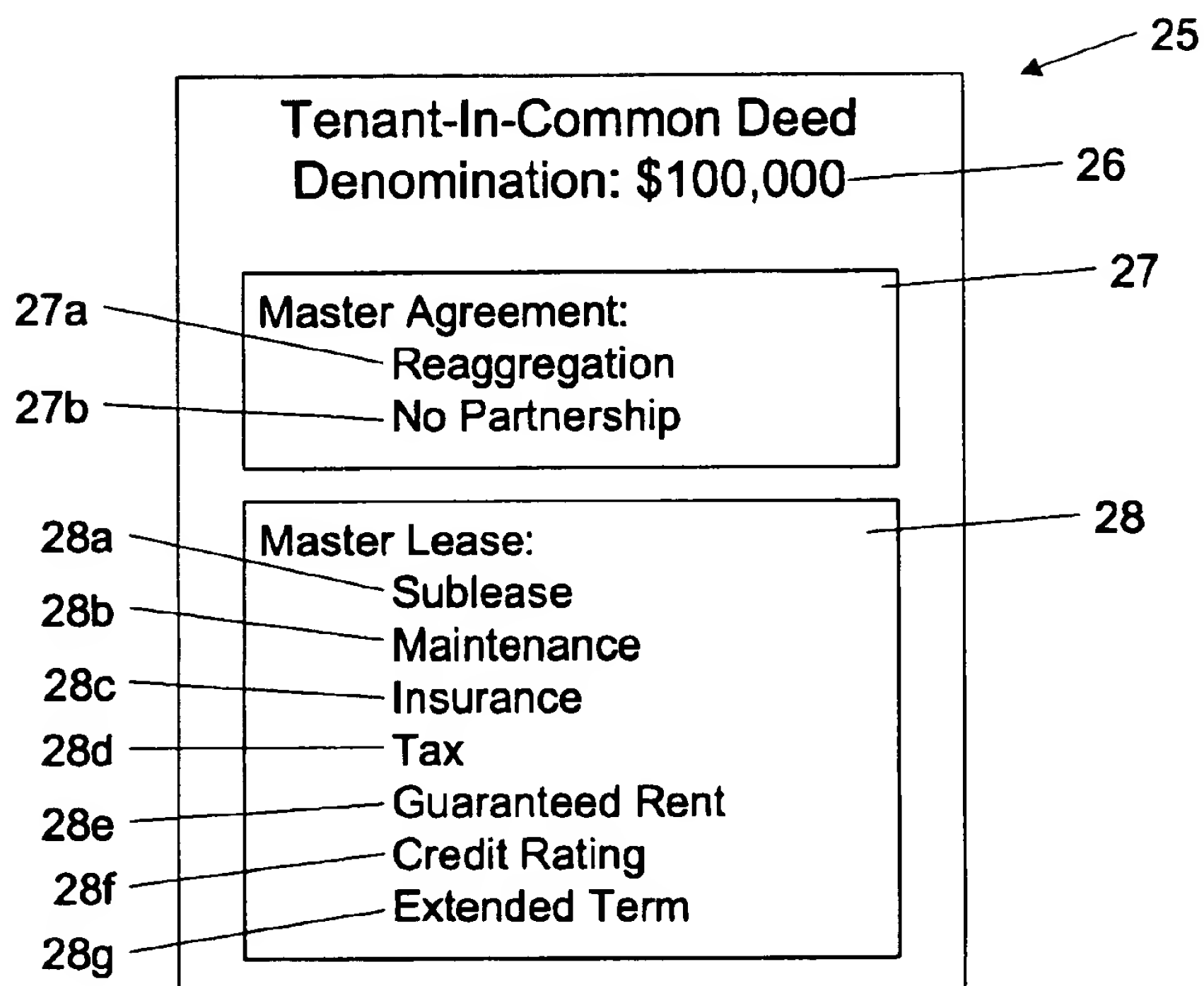


FIG. 3

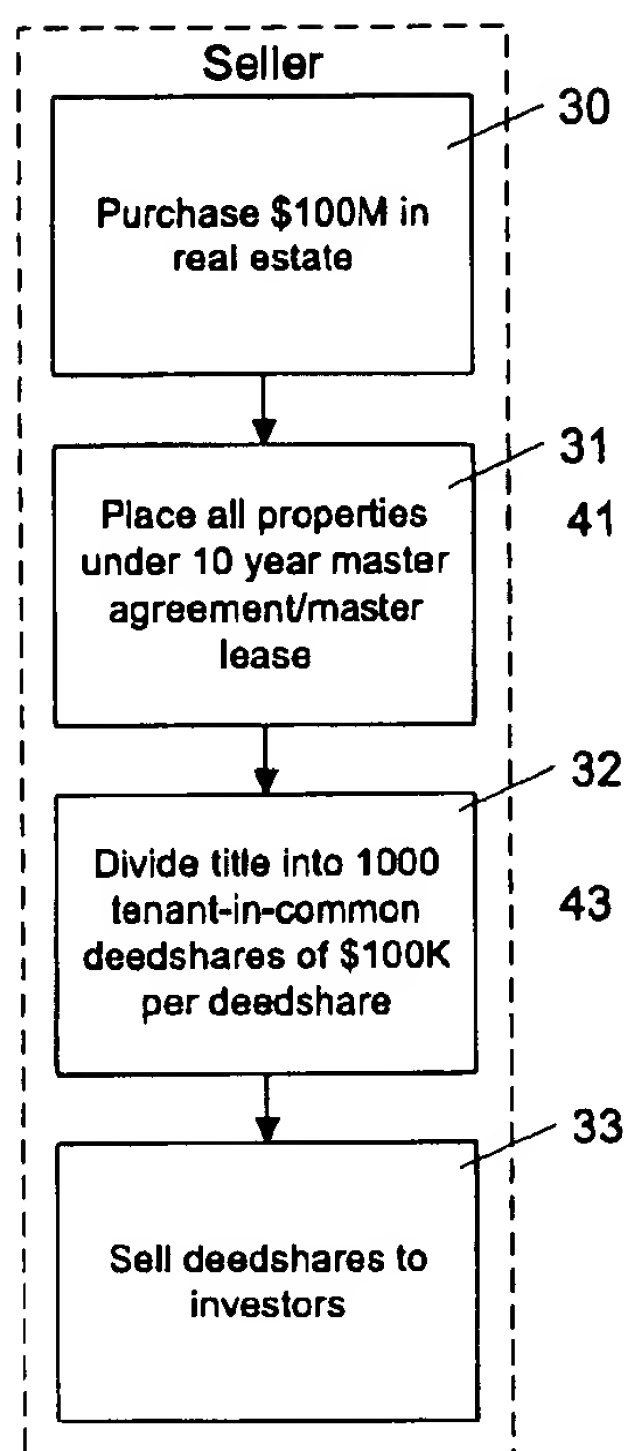


FIG. 4A

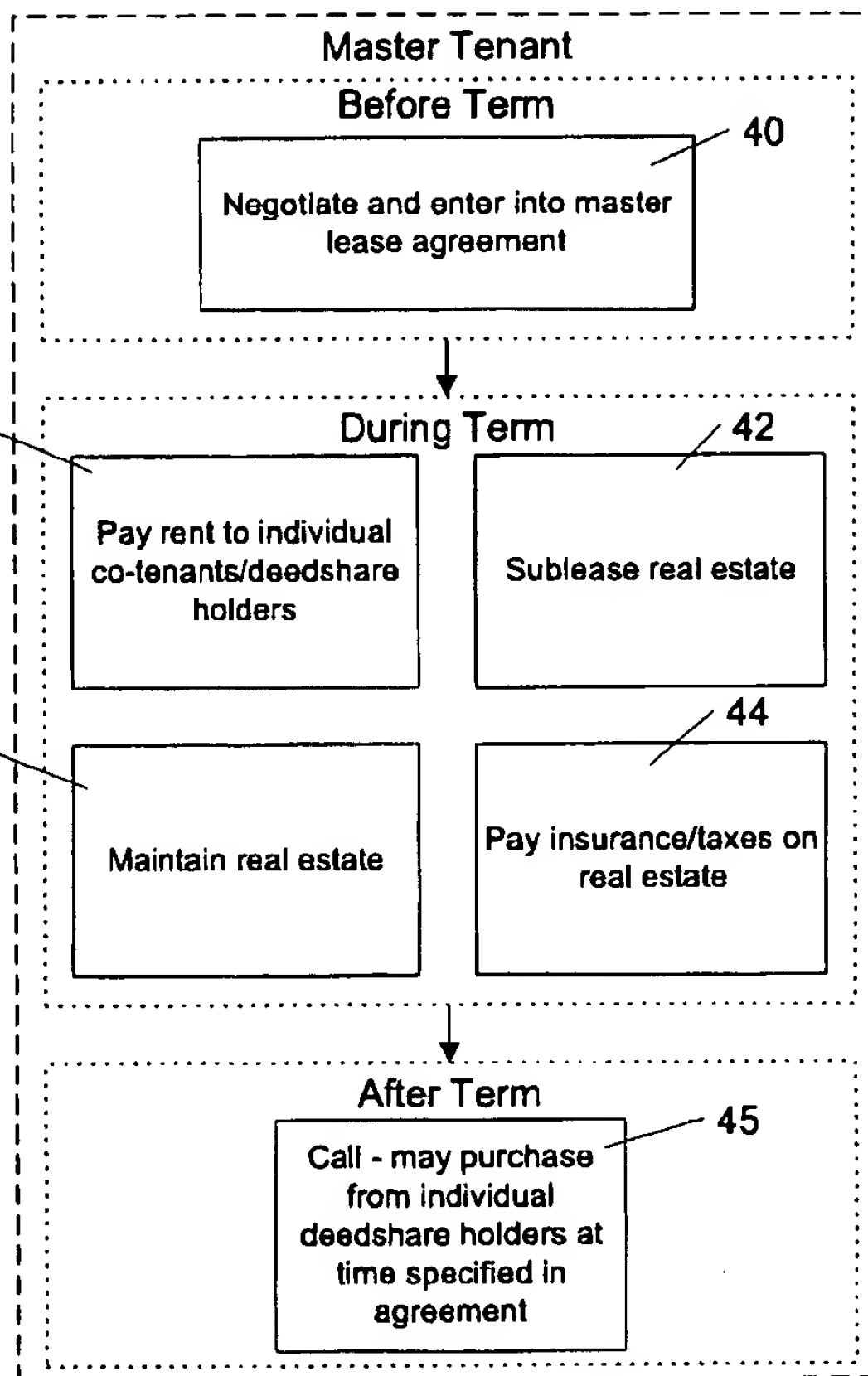


FIG. 4B

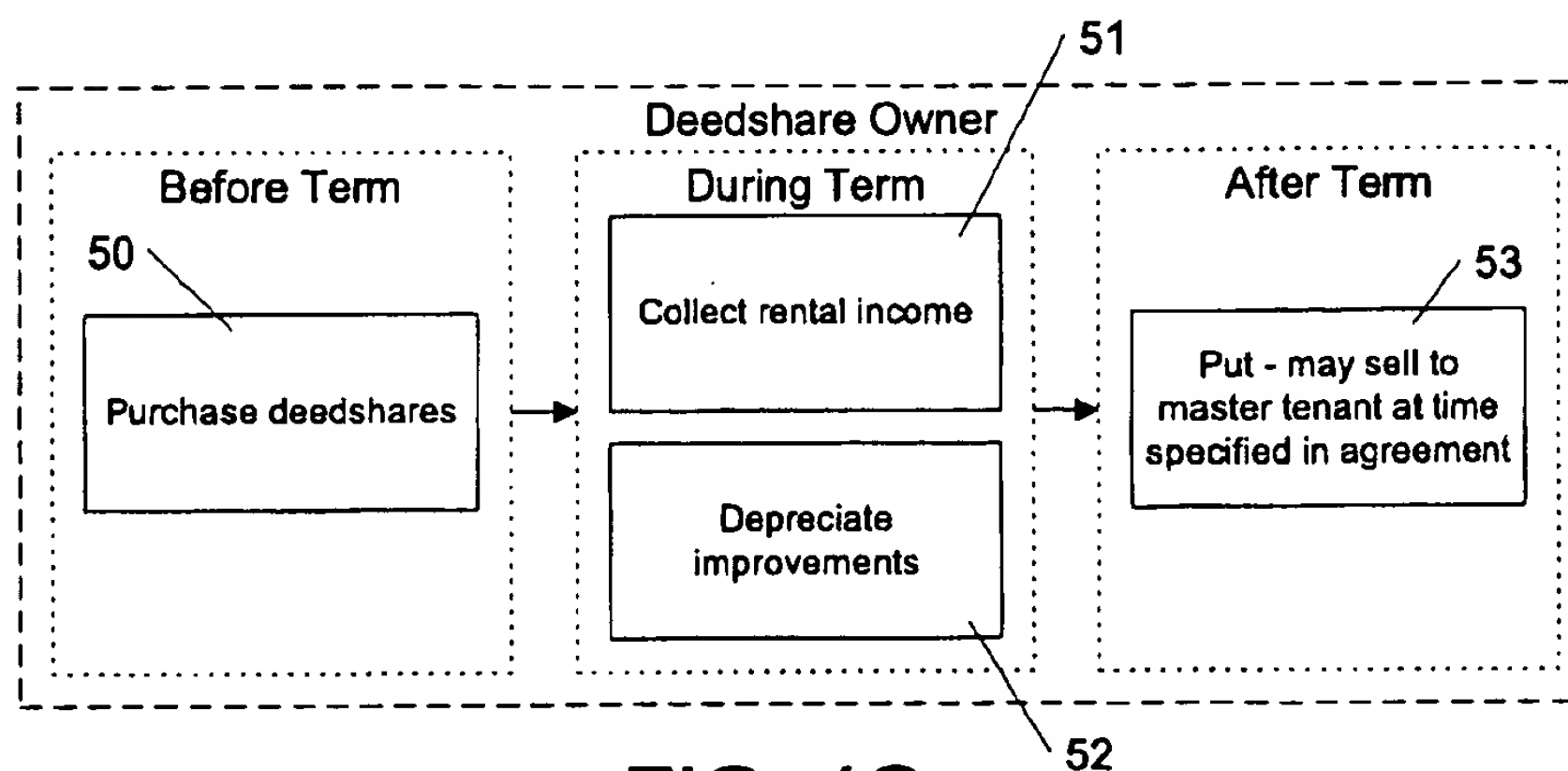


FIG. 4C

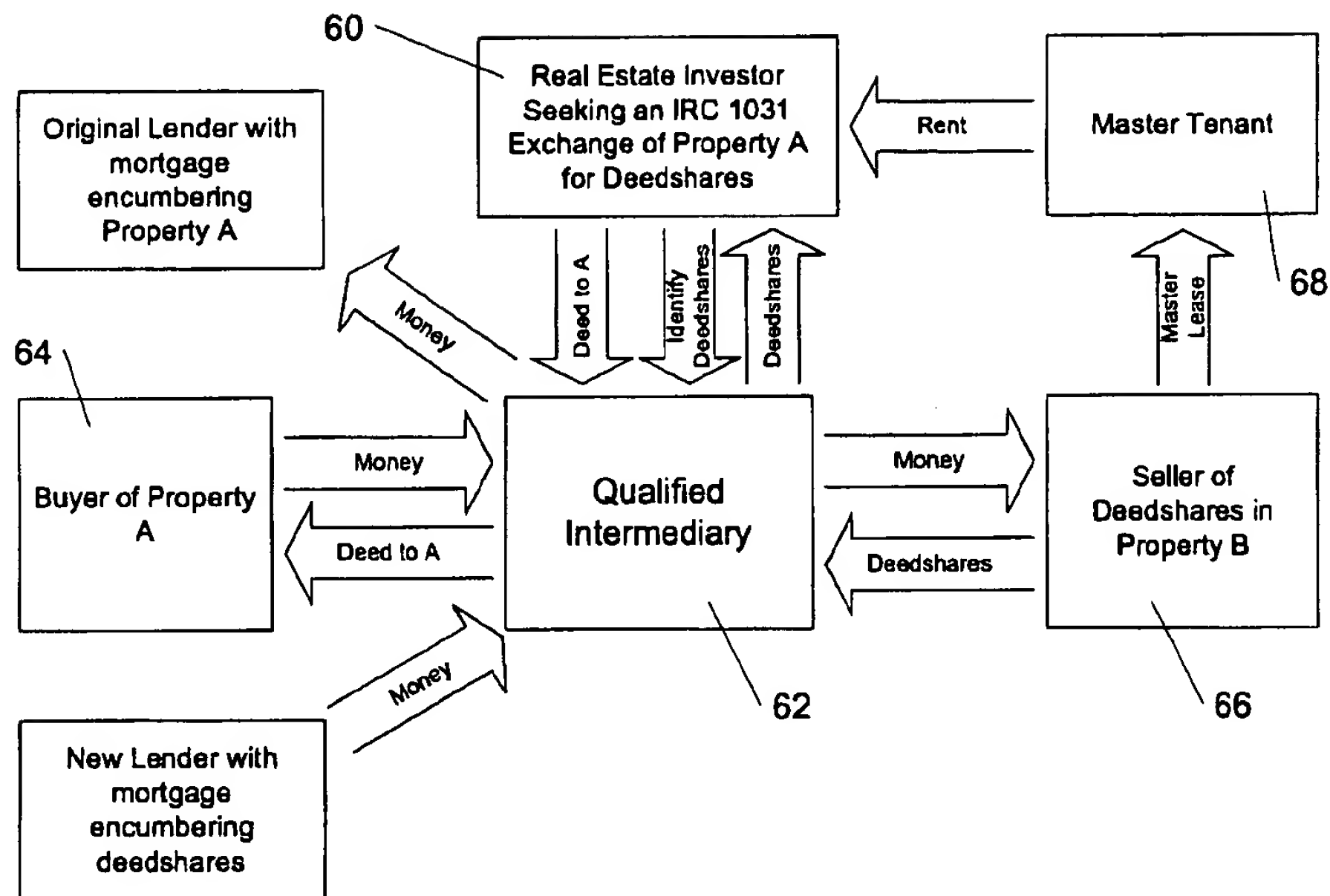


FIG. 5

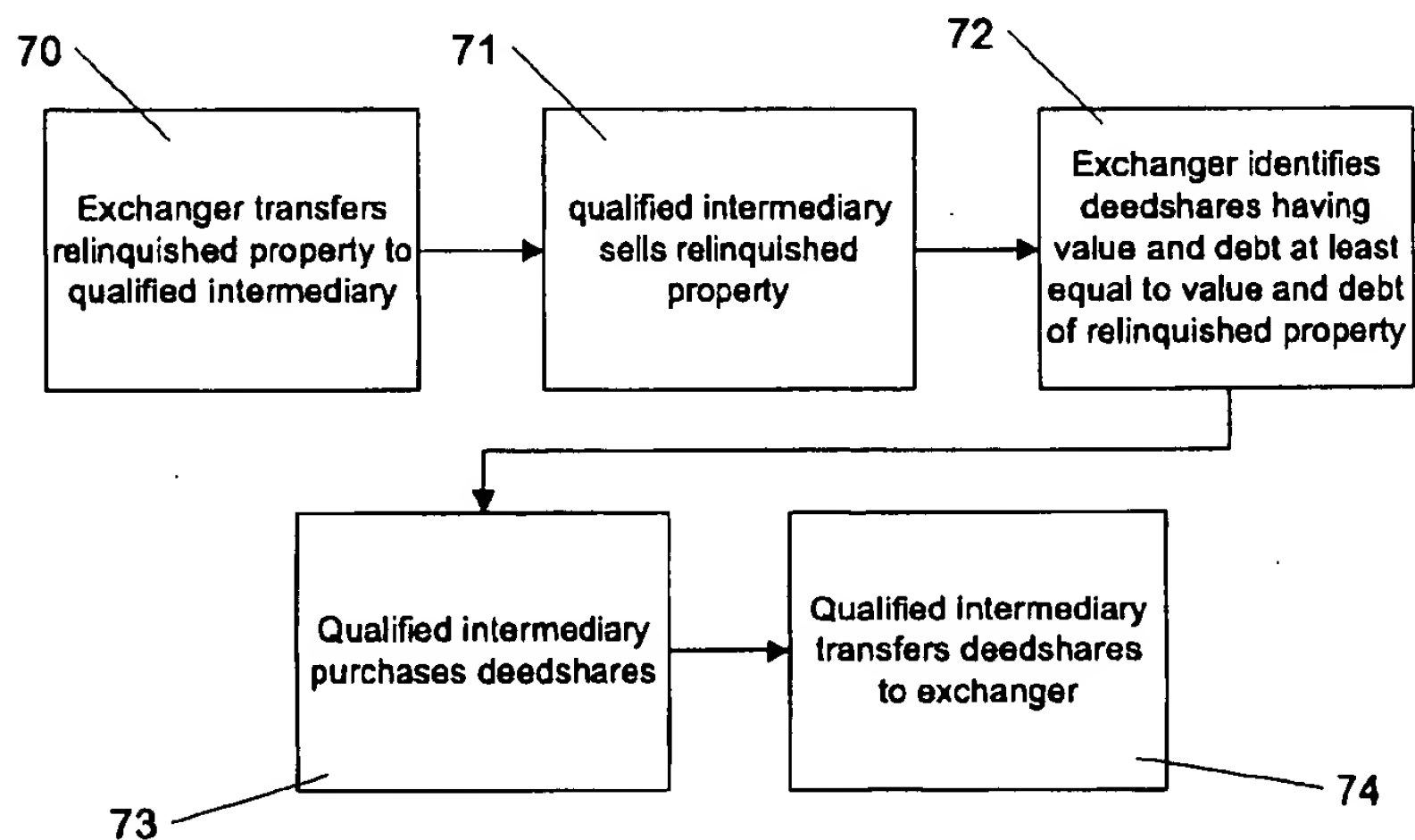


FIG. 6

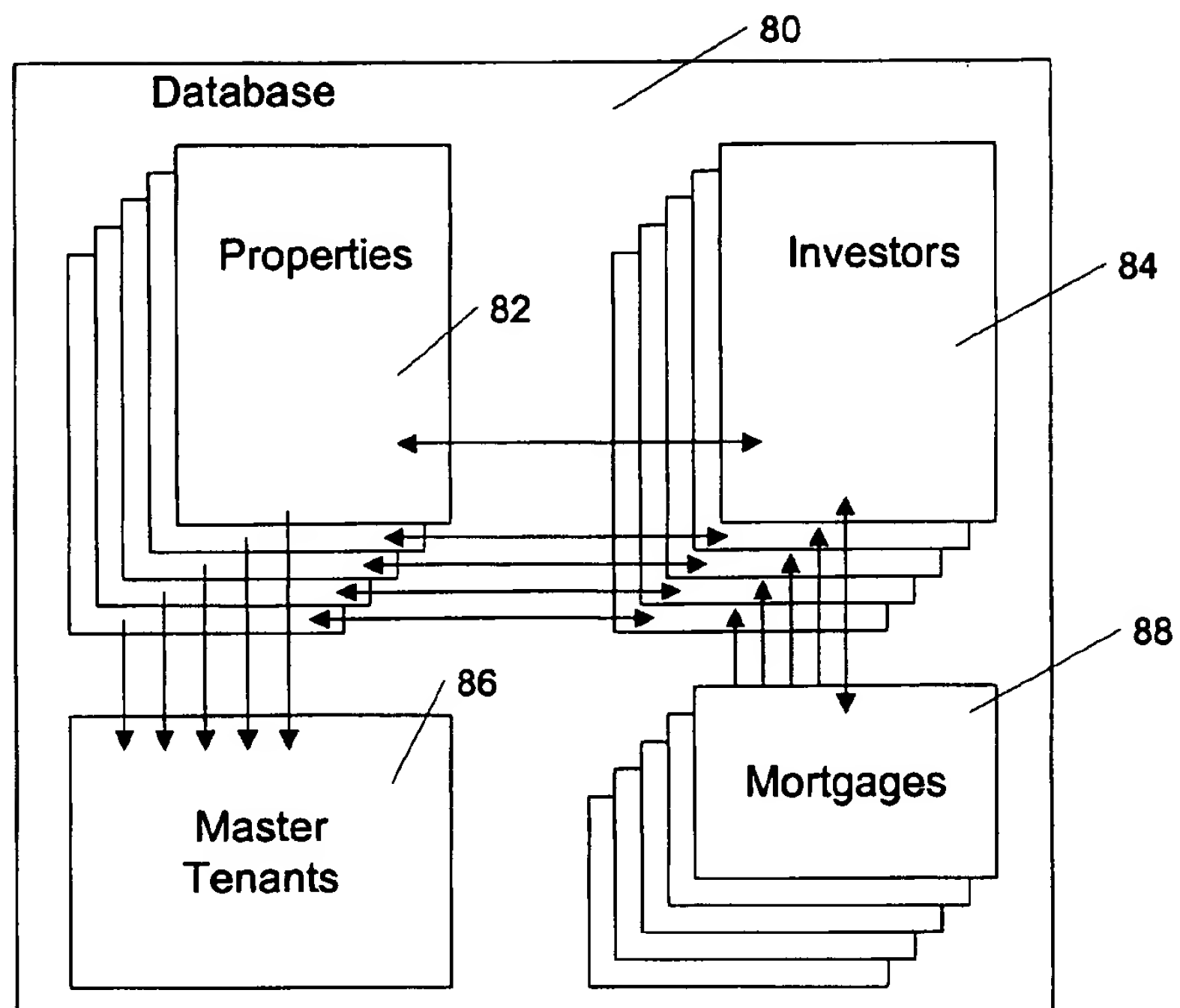


FIG. 7

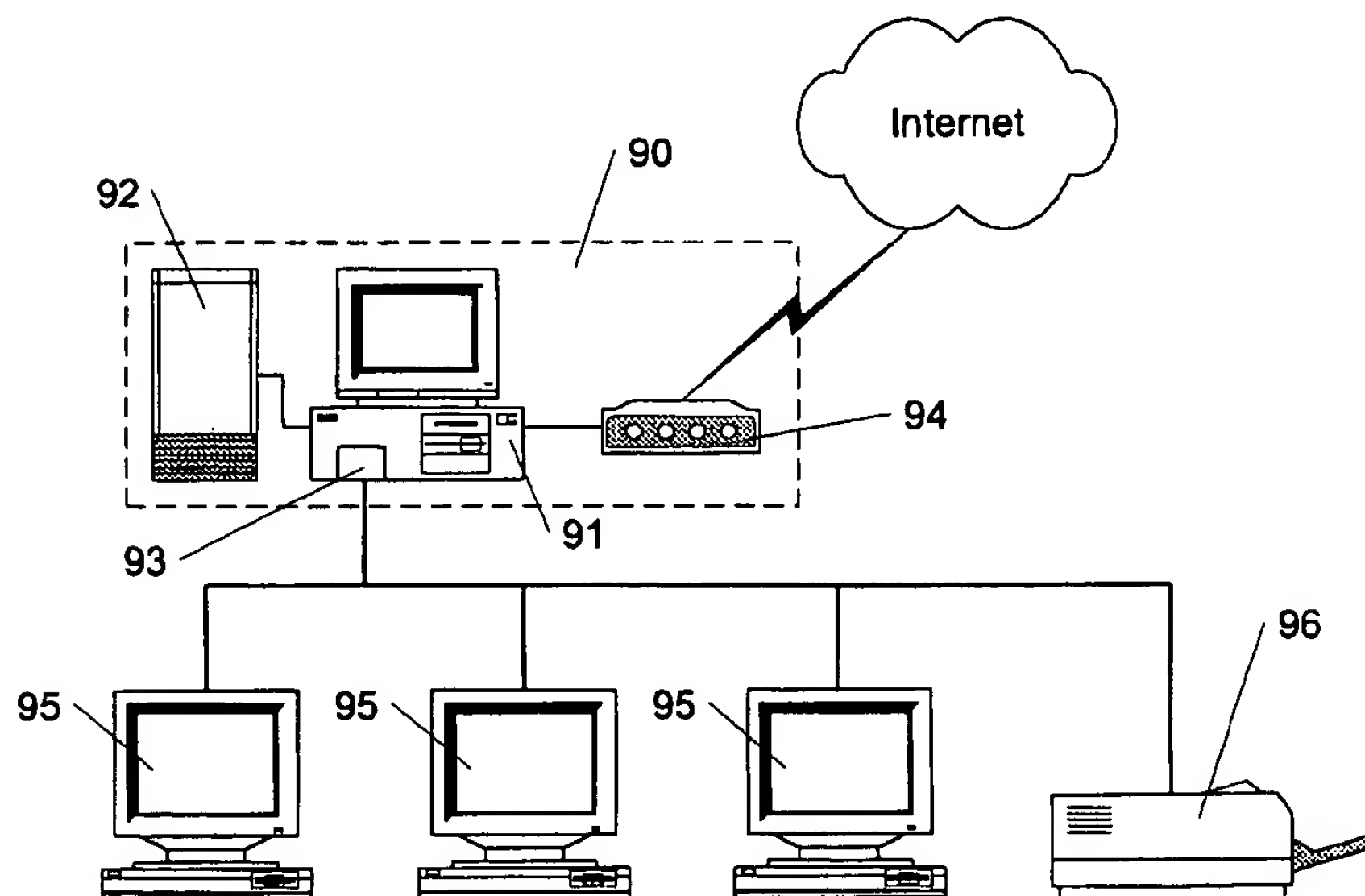


FIG. 8



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## METHODS AND INVESTMENT INSTRUMENTS FOR PERFORMING TAX- DEFERRED REAL ESTATE EXCHANGES

### FIELD OF THE INVENTION

The present invention relates generally to methods and investment instruments for performing tax-deferred real estate transactions, and more particularly to methods and instruments for performing tax-deferred exchanges of investment real estate under 26 U.S.C. §1031.

### BACKGROUND OF THE INVENTION

As the population of America ages, the investment concerns of Americans are changing. Mature investors desire investments that provide a safe, steady income stream. Such investors also generally desire liquidity, so that their investment interests can easily be sold or rearranged. Additionally, investors generally do not want to actively manage their investments.

Mature investors also may have numerous concerns related to inheritance. For example, most mature investors would like their investments to be divisible, so that they may be easily divided among heirs. Additionally, these investors may want their estates to be able to sell part of their investment holdings to pay estate taxes.

Investment real estate has difficulties meeting many of these desires. Generally, small to mid-sized real estate holdings require active management to return a steady income. Furthermore, if an investor divides the title to a small real estate holding, such as a store, or a single building, the pieces generally have less value than the whole and are difficult, expensive and time-consuming to sell. Many of the foregoing concerns affect investors of all age groups, particularly in view of the challenging lifestyles of most modern American workers and professionals.

Despite the foregoing difficulties, however, a large amount of money is currently invested in real estate that is either income-producing or held for investment. In 1996, for example, the total value of commercial real estate in the United States was estimated at approximately four trillion dollars. Much of this real estate (approximately \$2.75 trillion in 1996) was privately owned and held by individuals and corporations. A sizable fraction of these holdings are owned by small to mid-sized real estate investors (i.e., those having holdings between \$500,000 and \$10 million).

Such small to mid-sized real estate owners can sell their real estate and put their earnings into investments such as high grade bonds or bond funds, which provide the kind of liquidity, and relatively safe and steady income that many investors desire. Unfortunately, selling investment real estate or commercial real estate that has appreciated in value may result in severe tax consequences. For example, a property that was originally purchased many years ago for \$50,000, and sold for \$450,000, has a taxable gain of \$400,000. Under the current tax code, as much as 28% of this gain (or \$112,000), is payable as federal tax.

Title 26, Section 1031 of the Internal Revenue Code (hereinafter "IRC § 1031") permits deferral of the taxes on investment real estate by reinvesting in other investment real estate, subject to several conditions. Thus, for example, the owner of a small store could use a "1031 exchange" to defer taxes when he or she sells the store and reinvests the proceeds in an apartment building. To receive all of the benefits from an IRC § 1031 exchange, the new property (the "replacement property") must have both value and debt

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that are equal to or greater than the value and debt of property being sold (the "relinquished property").

Thus, if the relinquished property was sold for \$450,000, and was subject to a \$100,000 mortgage, the replacement property must be purchased for at least \$450,000, and must be subject to at least \$100,000 in debt. If the value or debt of the replacement property is less than that of the relinquished property, taxes are payable on the difference, known as "boot".

IRC § 1031 also imposes certain time limits for completion of the transaction. Once the relinquished property has changed ownership, the owner of the exchanged property (the "exchanger") has 45 days to identify replacement property choosing either the three-property or the 200% rule, and a total of 180 days to close on the replacement properties. If these time limits are not met, the transaction is not deemed to be an "exchange," and gains from the sale are subject to taxation. Additionally, the exchanger cannot exercise control, either direct or indirect, over the proceeds of the sale of the first property. For this reason, IRC §1031 exchanges generally are handled by a third party, a so-called "qualified intermediary," who sells the relinquished property on behalf of the exchanger, holds the proceeds of the sale, acquires the replacement property that has been designated by the exchanger, and transfers title to the replacement property to the exchanger.

IRC §1031 exchanges help in meeting the concerns of many investors by permitting a tax-deferred exchange. For most owners of high-maintenance investment or commercial real estate, or investment real estate without a safe, steady income stream, however, it is difficult to locate an acceptable replacement property requiring less active management and that produces a more steady income stream. Also, because the investment is still in real estate, other concerns of investors, such as liquidity and divisibility are not addressed by the availability of IRC §1031 exchanges. Furthermore, many attempted IRC §1031 exchanges fail, with devastating tax consequences, due to difficulties in identifying and closing on suitable replacement properties within the time limits imposed by the statute.

Numerous attempts have been made to provide real estate investments that are transferable, have a steady income stream, require low management effort, and are divisible. One way of gaining these benefits is by investing in a real estate investment trust (a "REIT"). A REIT is a company that buys, sells, manages, and develops real estate or real estate mortgages on behalf of its investors. Shares in a REIT may be purchased, or (for some REITS) acquired indirectly in exchange for property, as described below. These shares are often publicly traded on major exchanges, and have characteristics similar to the characteristics of shares in any other company. For example, the shares are easy to liquidate, and often provide a reasonably steady stream of income through dividends.

A real estate investor goes through a two-step process if he or she seeks to use a REIT to take advantage of a tax-exempt transaction. First, the investor contributes the real estate property to a partnership owned by the REIT. Next, at such time as the investor elects to liquidate his or her interest, he or she exchanges the partnership interest for REIT shares. The second exchange is a taxable exchange and the investor may not utilize IRC §1031 to acquire other real estate in a tax exempt transaction. Once the investor completes the first step the only option the investor has is to acquire REIT shares in a taxable transaction.

Basically, shares in a REIT are simply shares in a company—not a deeded ownership interest in specific com-

mercial or investment real estate. Thus, individual shareholders in a REIT may not be able to exert much control over the size or investment quality of the holdings of the REIT over a long term. Also, the market value of the REIT shares may fluctuate differently than the market value of the assets owned by the REIT. In addition, an IRC §1031 exchange cannot be used to defer the taxes on an exchange of investment property for shares in a REIT. REITs therefore do not provide a way to convert an interest in real estate into an investment with more desirable characteristics without incurring significant market risk and tax consequences.

Another way of spreading the risk and management burden of a real estate investment is to join a group of investors to purchase real estate as tenants-in-common. In arrangements of this sort, each of the tenants-in-common typically receives an undivided part interest in the real estate that is the subject of the transaction, in proportion to the amount of his or her investment. The tenants-in-common also enter into an agreement providing for exercise of joint control over the property, and for sharing the maintenance and management costs.

While the foregoing approach may provide a steady income stream from a real estate investment with certain favorable attributes, such arrangements have several disadvantages. First, it may not be easy to liquidate an undivided part interest in real estate due to the specific nature of the underlying assets. Additionally, depending on the number of investors involved and the nature of the agreement under which control is exercised over the property, such an arrangement may be deemed by the Internal Revenue Service to constitute a partnership. Since IRC §1031 specifically excludes exchanges of interests in partnerships, it is not possible to do a tax deferred exchange into this type of arrangement.

In view of the foregoing, it would be desirable to provide methods of investing in real estate that provide safety, a steady income stream, divisibility, ready liquidity, and no involvement in management of the property.

It would further be desirable to provide an investment instrument and methods for exchanging investment or commercial real estate that provide safety, a steady income stream, divisibility, ready liquidity, and no involvement in management of the property, and that meet the requirements of IRC §1031, thereby enabling a tax-deferred exchange.

It still further would be desirable to provide an investment that permits substantial tax-deferral benefits, that may be readily alienated, and that provides a steady and relatively low risk return.

It even further would be desirable to provide a system for implementing methods that enable investors to realize substantial tax-deferred benefits in accordance with IRC §1031.

### SUMMARY OF THE INVENTION

It is an object of the present invention to provide methods and an investment instrument for investing in real estate that provide safety, a steady income stream, divisibility, ready liquidity, and no involvement in management of the property.

It is another object of this invention to provide investment instruments and methods for exchanging investment or commercial real estate for an interest in investment in specific real estate that provide safety, a steady income stream, divisibility, ready liquidity, and no involvement in management of the property, and that meet the requirements of IRC §1031.

It is a further object of the present invention to provide an investment that permits substantial tax-deferral benefits, that

may be readily alienated, and that provides a steady and relatively low risk return.

It is a still further object of the present invention to provide a system for implementing methods that enable investors to realize substantial tax-deferred benefits in accordance with IRC §1031.

These and other objects of the present invention are achieved by creating a new type of investment instrument, a "deedshare," that represents both a tenant-in-common interest in real estate, and provides the divisibility and liquidity of a traditional security, such as a bond. Deedshares created in accordance with the principles of the present invention preferably are available in predetermined denominations, provide a guaranteed steady income stream, are readily transferable, readily alienated, and are suitable for identification as replacement property under IRC §1031. The deedshares may be encumbered by a mortgage, as required by the particular needs of an individual investor, so as to comply with the debt provisions of IRC §1031. Because deedshares are a direct interest in investment real estate, and the tenant-in-common owners of the real estate do not exercise significant control, and thus are not deemed partners, investors may use IRC §1031 to perform tax-deferred exchanges.

In accordance with the methods of the present invention, a series of steps are involved in creating and managing this new type of real estate investment. First, real property having a preselected total value is purchased and aggregated, and may consist of a number of commercial real estate parcels. The aggregated properties are then made subject to at least one master agreement. Title to the property is then divided into tenant-in-common deeds of at least one predetermined denomination. The master agreements include a provision by which the tenant-in-common deeds may be "reaggregated" after a specified interval, so that the property may be disposed of. The tenant-in-common deeds, subject to master agreements configured in accordance with the methods of the present invention, are referred to herein as "deedshares."

In a preferred embodiment, the master agreements include a master lease, under which the property is leased to a master tenant, who manages the property. During the term of the master lease, the deedshare holders receive a steady, guaranteed income stream from the master tenant, similar to the income one might expect from a high grade bond, e.g., a bond having an AA rating or better. This guaranteed steady income stream also provides a high degree of liquidity. The deedshare holders also obtain favorable tax treatment by being allocated their proportionate share of depreciation so long as they own a deedshare.

At the end of the interval specified in the master lease, the deedshares are subject to a put/call arrangement, whereby the individual owners of deedshares have a right and an obligation to sell their deedshares to the master tenant or some third-party, receiving fair market value for their deedshares. This serves to reaggregate title to the property under the master tenant. The former deedshare holders may, subject to IRC §1031 guidelines and prior to the reaggregation of the property, exchange the deedshares for deedshares having a later maturity date, or for other investment real estate, through another tax-deferred IRC §1031 exchange.

A system of implementing the deedshares and methods of the present invention is also provided for use with a computer system, which enable automated tracking of various items of information relating to the real estate portfolio, master agreement, and investors.

## BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects and advantages of the present invention will be apparent upon consideration of the following detailed description, taken in conjunction with the accompanying drawings, in which:

FIG. 1 illustrates a prior art IRC §1031 exchange conducted through a qualified intermediary;

FIG. 2 shows the structure of the new real estate investment methods and investment instrument of the present invention;

FIG. 3 depicts an illustrative embodiment of an investment instrument of the present invention;

FIGS. 4A–C illustrate steps taken by each party to an IRC §1031 exchange performed in accordance with a preferred embodiment of the present invention;

FIG. 5 shows an IRC §1031 exchange used for tax-deferred exchange of investment property for “deedshare,” in accordance with the principles of the present invention;

FIG. 6 is a flowchart of an IRC §1031 exchange in which investment property is exchanged for deedshares;

FIG. 7 depicts an illustrative computer database structure for implementing the methods and investment instrument of the present invention; and

FIG. 8 shows an illustrative computer system and network for executing a database application implementing the methods and investment instrument of the present invention.

## DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1, a previously known tax-deferred exchange according to IRC §1031 (Title 26, United States Code Section 1031) is described. Exchanger 10, who wishes to exchange investment real property A, provides a third party, typically qualified intermediary 12, with the deed to property A. Qualified intermediary 12 then transfers the property to buyer 14 in exchange for money. Once the property is transferred to buyer 14, IRC §1031 specifies that exchanger 10 has 45 days to designate replacement properties, and 180 days to close on any replacement properties for the transaction to be considered an “exchange.” Exchanger 10 designates replacement investment real property B, owned by owner 16. Qualified intermediary 12 then acquires replacement property B from owner 16 and transfers replacement property B to exchanger 10 and money to owner 16. Exchanger 10 must obtain a mortgage replacement on property B in an amount at least equal to the amount of any mortgages on relinquished property A.

In designating replacement properties under IRC §1031, exchanger 10 may identify up to 3 potential properties to serve as replacements. More than three replacement properties may be identified, as long as the aggregate value of all of the designated properties adds up to no more than twice the value of the relinquished property.

IRC §1031 also requires that when the exchange is complete, the value and debt of the replacement property must both be greater than or equal to the value and debt of the relinquished property. If the replacement property has a lower value, or is subject to a smaller mortgage than the relinquished property, the boot is taxable. This rule ensures that taxes are paid on any money that is taken out of the investment real estate during the exchange.

Qualified intermediary 12 is used to perform the exchange, because if exchanger 10 exercises control over the money acquired from buyer 14, the entire transaction may

not be viewed as an exchange of property, and the proceeds of the sale of the relinquished property may be taxable. It should also be noted that tax-deferred exchanges under IRC §1031 also require that the exchanger intend to hold the replacement property for productive use in a trade or business or for investment.

IRC §1031 also sets out certain exceptions. One important exception is that interests in a partnership are not subject to tax-deferred exchanges. Other exceptions include beneficial interests, and property held primarily for sale.

Problems with identifying and closing on replacement properties within the required time limits cause many attempted §1031 exchanges to fail, with substantial negative tax consequences to the property owner who was attempting the exchange. In addition, because §1031 exchanges simply trade the relinquished property for the replacement property, it is difficult to use a §1031 exchange to acquire an investment interest with diversity, divisibility, high liquidity, or guaranteed returns.

To address these difficulties with IRC §1031 exchanges, the applicants have developed new methods, and investment instruments especially suited for performing real estate exchanges. In accordance with the principles of the present invention, this new investment instrument provides an exchanger with a direct interest (i.e. not a beneficial interest or partnership interest) in real estate, so that a tax-deferred exchange under IRC §1031 may be used to trade into the new investment. The new investment also is easy to identify as a replacement property and to close on, so that there are no difficulties in completing the transaction within the time limits specified in IRC §1031. Additionally, the investment created in accordance with the present invention preferably provides guaranteed returns, a steady income stream, diversity, divisibility, and liquidity.

Referring now to FIG. 2, the structure and operation of a preferred embodiment of the investment methods and investment instrument of the present invention are described. First, a number of commercial properties are identified and acquired to form a real estate portfolio 20, a process referred to herein as “aggregation.” Because a large number of quality properties are selected for the portfolio, the aggregate value of the portfolio may be quite high, e.g., several tens of millions of dollars. This in turn makes the portfolio an attractive investment opportunity, and enables a resale market to be readily established.

Real estate portfolio 20, illustratively comprising real estate having a total value of \$100 million, then is subjected to a master agreement, described hereinbelow, and divided into deedshares 22 having of a single or multiple specified denominations. In FIG. 2, each of deedshares 22 illustratively has a specified denomination of \$100,000 per deed share, so that the \$100 million value of real estate portfolio 20 is divided into one thousand \$100,000 deedshares 22.

Each of deedshares 22 is a tenant-in-common deed to a proportional (0.1%) undivided part interest in real estate portfolio 20. As an interest in real property, each deedshare 22 may be subjected to a separate mortgage in whatever amount is required to meet the needs of a particular investor, thus enabling the transaction to comply with the debt provisions of IRC §1031. In accordance with the principles of the present invention, and to provide desirable characteristics such as liquidity and guaranteed income, each of deedshares 22 is created subject to master agreement 24, which preferably includes a master lease, as described hereinafter.

Master agreement 24 comprises an agreement that ensures that all of deedshares 22 can be reaggregated after a speci-



fied interval, e.g., 10 years, so that real estate portfolio 10 may be disposed of, and the proceeds distributed to the holders of deedshares 22. This mechanism provides a way to get invested money back out of real estate portfolio 20 without requiring that the holders of deedshares 22 exercise control over their individual ownership interests, thereby avoiding the attributes of a partnership.

In a preferred embodiment, the agreement to reaggregate the property interests of deedshares 22 may be achieved by building a put/call mechanism in the deedshare, whereby each of the individual owners of deedshares 22 has a right and an obligation to sell deedshares 22 to a specified buyer (e.g., the entity holding the master lease) at fair market value. Other types of agreements also may be used for this purpose. For example, master agreement 24 may include an exclusive sales provision, giving a specified real estate broker the exclusive right to sell real estate portfolio 20 after the specified time. Generally, any agreement whereby ownership of deedshares 22 is conditioned upon an agreement to sell the deedshares, at a specified time (or maturity date), or under specified conditions, is expected to accomplish the goal of reaggregating the tenant-in-common interests represented by deedshares 22 into a unified title in real estate portfolio 20.

Master agreement 24 preferably comprises provisions that prevent holders of deedshares 22 from providing common services with respect to real estate portfolio 20, from entering into joint venture activities with respect to real estate portfolio 20 with fellow owners of deedshares 22, from establishing a common trade name in relation to their holdings of deedshares 22, and from commingling or establishing joint financial arrangements with respect to real estate portfolio 20 with other owners of deedshares 22. These provisions are intended to prevent owners of deedshares 22 from acquiring the attributes of a partnership, which might otherwise make deedshares 22 ineligible for tax-deferred treatment under IRC §1031.

For the foregoing reason, master agreement 24 preferably also includes no provisions that require joint management activity on the part of owners of deedshares 22. For example, the owners of deedshares 22 should not be required (or permitted) to vote on the sale of real estate portfolio 20.

In a preferred embodiment, master agreement 24 comprises a master lease, whereby a master tenant is placed over the properties in real estate portfolio 20. The master tenant agrees to pay rent to the owner of portfolio 20, including the individual holders of deedshares 22, over a specified term. The master tenant also is given the right to sublease the real estate, and is responsible for paying the taxes, upkeep, maintenance, and insurance on the leased property.

The credit rating of the master tenant plays a role in ensuring that the holders of deedshares 22 receive a guaranteed income stream from the rent paid by the master tenant. Preferably, the master tenant is a commercial entity having at least an AA credit rating or better. Alternatively, a master tenant having a credit rating less than AA may be employed, in which case the master tenant may be "credit enhanced" by making a payment to a third party to guarantee any shortfall between the rate of return guaranteed in the deedshare and the actual income from the property.

Applicants believe that by providing a guaranteed income stream over a specified term, the investment instrument and methods of the present invention will make the investment value of deedshares 22 comparable to that of high quality commercial bonds. Accordingly, it should be possible to establish a market in this type of investment instrument, thus

making deedshares 22 easy to liquidate. It is expected, for example, that it should be possible to buy or sell deedshares 22 in the same manner that bonds or shares of mutual funds currently are traded.

Master agreement 24 also may contain other provisions relating to the master tenant. For example, the put/call provisions preferably specify the master tenant as the entity to which deedshares 22 are sold at the end of the specified time. Additionally, it is possible to adjust the profit made by the master tenant on this sale by adjusting the term of the master lease and the specified time during which deedshares 22 are held to maturity.

For example, if the master lease is for a term of 15 years, but deedshares 22 call for title to the real estate portfolio to be reaggregated after 10 years, then the fair market value of real estate portfolio 20 will be influenced by the encumbrance of the additional five year term of the lease. Accordingly, the master tenant will be able to purchase real estate portfolio 20 back from the holders of deedshares 22 at a favorable price, thus encouraging the funding of such arrangements.

As will be understood by one skilled in the banking and investment arts, the size of real estate portfolio 20 may be selected to suit the needs of the prospective pools of investors. Additionally, the denominations of deedshares 22 may be selected at any suitable value, and real estate portfolio may include several classes of deedshares, each class having a different predetermined denomination. The terms of master agreement 24 also may be varied, depending on the nature and growth objectives of real estate portfolio 20 and the needs of prospective investors.

Referring to FIG. 3, an example deedshare is shown. As discussed above, deedshare 25 comprises a tenant-in-common part interest in the property. Deedshare 25 has predetermined denomination 26 (\$100,000 in this case), that determines the share of an overall real estate portfolio that is represented by deedshare 25. Deedshare 25 also includes master agreement 27, that includes provision 27a for reaggregating title to the property in the real estate portfolio after a specified interval. In a preferred embodiment, this is accomplished through use of a put/call provision, as explained above.

In a preferred embodiment of deedshare 25, master agreement 27 also comprises provision 27b, which prevents holders of the deedshares from exercising control over the property interest represented by deedshare 25, so that the deedshare holders may not be deemed to be a partnership, as explained above. A preferred embodiment of deedshare 25 is also encumbered by master lease 28, whereby the real estate interest represented by deedshare 25 is leased for a specified term to a master tenant in exchange for rent paid to the owners of the real estate, including the holder of deedshare 25.

Master lease 28 preferably includes sublease provision 28a, permitting the master tenant to sublease the real estate, maintenance provision 28b, requiring the master tenant to maintain the real estate, insurance provision 28c, requiring the master tenant to insure the real estate, and tax provision 28d, requiring the master tenant to pay taxes on the real estate. The master lease also may include guaranteed rent provision 28e, designating that the master tenant pay a predetermined guaranteed income to the holder of deedshare 25, and credit rating provision 28f, requiring that the master tenant have a minimum credit rating of AA. Additionally, master lease 25 may contain extended term provision 28g, designating that the master lease extends beyond the term of

the master agreement, affecting the fair market value of the property, as discussed above.

Referring now to FIGS. 4A–C, the steps taken by various parties in accordance with a preferred embodiment of the methods of the present invention are described. In FIG. 4A, the steps taken by the seller of the deedshares, who may be the master tenant, are shown. First, at step 30, the seller purchases and aggregates a real estate portfolio having a predetermined value, e.g., \$100 million.

In step 31, the real estate portfolio is encumbered with a master agreement and master lease for a specified interval, e.g., 10 years. The master agreement includes a mechanism, discussed hereinabove, to reaggregate title from the holders of the deedshares to enable the real estate portfolio to be disposed of at the end of the term of the master agreement. In step 32, title to the real estate in the portfolio is divided into tenant-in-common deeds having a predetermined denomination, e.g., 1000 deeds each having a \$100,000 value, creating “deedshares.” Finally, at step 33, the seller sells the deedshares to the public, either directly, or through qualified intermediaries via IRC §1031 exchanges.

FIG. 4B shows the steps taken by the master tenant, starting with entering into the master lease, at step 40. During the term of the master lease, several steps are taken. At step 41, the master tenant pays monthly rent on the lease to the deedshare holders (co-tenants). The master tenant then subleases the property (typically at a profit) to one or more subtenants at step 42. In steps 43 and 44, the master tenant maintains the property, and pays the taxes and insurance on the property. When the term of the deedshare has expired, at step 45, the master tenant exercises his call to purchase the deedshares from the individual deedshare holders at a calculable value, such as fair market value.

FIG. 4C shows the steps taken by a deedshare holder. At step 50, the deedshares are purchased from the seller, either directly, or through a qualified intermediary as part of an IRC §1031 exchange, as described in greater detail hereinbelow. During the term of the deedshares, the deedshare holder receives guaranteed monthly income from the rent paid by the master tenant (step 51). During the term of the deedshares, each deedshare holder is permitted to depreciate the deedshare holder’s tax basis in any improvements on the property for tax-accounting purposes (step 52). At the end of the term, at step 53, the deedshare holder exercises his put to force the master tenant to purchase the deedshares at fair market value. Prior to the end of the term of the master lease, a deedshare owner may freely alienate title to the deedshare.

It should be noted that in this preferred embodiment, if neither the put nor the call are exercised, the master tenant continues to pay rent to the deedshare holder to the end of the term of the master lease, and the deedshare holder continues to collect monthly income from the property, and yearly depreciation. Also, as discussed hereinabove with reference to FIG. 2, numerous modifications may be made to this arrangement. These modifications may include changing the size of the real estate portfolio, the denominations of the deedshares, the term of the master lease, the term of the deedshares before the put/call may be exercised, the terms of the master agreement, and the mechanism by which title to the real estate portfolio may be reaggregated.

Referring now to FIG. 5, the method of the present invention is described in the context of an IRC §1031 exchange. Since deedshares represent an interest in investment property, and the master agreement is designed to insure that the tenants-in-common do not acquire the attributes of a partnership, the deedshares are subject to tax-deferred treatment under IRC §1031.

Exchanger 60 of investment real property A provides qualified intermediary 62 with the deed to relinquished property A. Qualified intermediary 62 then transfers title to property A to buyer 64 in exchange for money. In accordance with the principles of the present invention, seller 66 of replacement property B encumbers property B with a master agreement, leases property B to a master tenant, and divides title in property B into tenant-in-common interests having predetermined denominations, to create deedshares.

Seller 66 then conveys an appropriate value of deedshares to qualified intermediary 62. Exchanger 60 identifies the deedshares of the present invention as the replacement property for the exchange and obtains a mortgage commitment in an amount at least equal to the mortgage on relinquished property A. Once the purchase of the deedshares “closes”, qualified intermediary 62 transfers the deedshares to exchanger 60, thereby completing the exchange.

Applicants expect that there will be a ready market for deedshares, because there should be no difficulty identifying deedshares or closing on the identified deedshares within the time limits specified in IRC §1031. Moreover, applicants expect that by acquiring multiple deedshares (perhaps of different denominations) it will be easy to meet or exceed the value of the exchanged real estate using deedshares as the replacement property. Because the deedshares of the present invention represent an interest in real estate, they may be held subject to a mortgage, so the debt on the exchanged real estate also can be matched or exceeded, as required by IRC §1031.

During the remaining portion of the specified term of the deedshares, exchanger 60 collects an income stream from his deedshares from master tenant 68, and may depreciate his interest in improvements on the replacement property B. When the deedshares reach maturity, or when exchanger 60 decides to sell his deedshares, they may be sold for money, incurring tax liability at that time, or they may be exchanged for other deedshares or for other investment real estate through a further tax-deferred exchange under IRC §1031.

A flowchart showing the individual steps in the process for performing an IRC §1031 exchange of investment real estate for deedshares is shown in FIG. 6. At step 70, the exchanger (i.e., exchanger 60 of FIG. 5) transfers the deed to the relinquished property to a qualified intermediary. Next, at step 71, the qualified intermediary sells the relinquished property to a buyer, in exchange for money. Any mortgage on the relinquished property is paid from the proceeds of the sale. At this point, IRC §1031 specifies that the exchanger has 45 days to identify replacement property, and 180 days to close on the replacement property.

In step 72, the exchanger identifies deedshares, as described hereinabove, to the qualified intermediary as the replacement property. To avoid boot, the identified deedshares must have denominations that add up to a value at least equal to the value of the relinquished property, and must be subject to mortgages that will add up to a value at least equal to the value of the mortgage on the relinquished property. In step 73, the qualified intermediary purchases the deedshares from a deedshare seller, closing the deal within the 180 day time limit specified in IRC §1031. Finally, in step 74, the qualified intermediary transfers the deedshares, subject to the appropriate mortgages, to the exchanger.

Referring now to FIG. 7, an illustrative implementation of the investment instrument and methods of the present invention is described. In FIG. 7, the properties and investors (deedshare holders) are tracked using a database application executed on a computer system. Database 80 contains four

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inter-related sets of tables—property tables 82, investor tables 84, master tenant table 86, and mortgage tables 88.

Each one of property tables 82 contains a list of properties associated with a single real estate portfolio that has been divided into deedshares, as described hereinabove. Each property in the list preferably includes information such as the name and address of the property, the type of property, the current income associated with the property, and the fair market value (as of last appraisal) of the property. Each property table, for example, may include information such as the total value of the properties in the table (real estate portfolio), the total number and denominations of outstanding deedshares on the properties in the table, and the date at which the deedshares become subject to the put/call under the master agreement. In addition, each one of property tables 82 may be associated with a master tenant in master tenant table 86.

Each one of property tables 82 is also associated with one of investor tables 84. Each investor table 84 preferably contains a list of all of the investors who hold deedshares in a particular real estate portfolio. For each investor, the database may include information such as the name and address of the investor, the number and denominations of deedshares held, the fair market value of the portion of the property associated with the deedshares (as of the last appraisal of the property), and the income provided to the investor based on the deedshares.

Master tenant table 86 may be a single table containing a list of the master tenants associated with each of the real estate portfolios. For each master tenant, database 80 preferably contains information such as the name and address of the master tenant, the credit rating of the master tenant (and any enhancement needed), and the rent paid by the master tenant under the master agreement. Alternatively, the identity of the master tenant, and related information, may be combined into property tables 82.

Mortgage tables 88 contain a list of the debt encumbering each investor's relinquished property and the debt associated with the deedshares held by each investor. This information may be used in conjunction with the information in property tables 82 to help investors assure that they obtain a sufficient mortgage on deedshares to comply with IRC §1031, and to assure lenders of the appropriate loan-to-value ratio which warrants the mortgage needed by investors.

Database 80 may be used to generate reports required by applicable securities laws, as well as reports on the value of each real estate portfolio, the rental income due to each deedshare holder, certain information required by deedshare holders to complete their income tax returns, or any other useful compilation of the data contained in database 80. Additionally, database 80 may be linked to other databases (either directly or through a network, such as the Internet), such as the databases kept by master tenants, to keep track of subleases and maintenance.

Pertinent information from database 80 may be made available to investors. The data in database 80 also may be made available to qualified intermediaries, to be used in identifying which deedshares of various real estate portfolios best match the needs of potential investors for IRC §1031 exchanges, or for identifying potential master tenants or subtenants.

It will be evident to one skilled in the art that there are other possible arrangements for the data in database 80. For example, the investor and property tables each may be organized as one large table, with each entry in the investor table having links to one or more of the entries in the

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properties table, and each entry in the properties table having links to one or more entries in the investor table. Also, the investor table may be replaced with a deedshare table, listing the deedshares in each of the real estate portfolios, wherein each deedshare entry contains information on an investor. Additionally, the information contained in each table may be varied. For example, each entry in the investors table may contain additional information on the investor, such as age, current income (for tax purposes), and information on other properties and investments held by the investor.

Referring to FIG. 8, an illustrative computer system and network for executing and accessing the database of FIG. 7 is shown. Computer system 90 is a database server that executes the database described hereinabove. Computer system 90 includes CPU 91, which executes instructions that implement a database server application, and mass storage 92, preferably a RAID array, on which the data that forms the database is stored. Computer system 90 also preferably includes network interface 93 so that the database may be accessed through other computers on a local area network.

Computer system 90 also preferably includes communication device 94, which may comprise a telephone modem, a cable modem, an ADSL modem, or any other device capable of communicating data between a computer and a wide area network. Communication device 94 is used to connect computer system 90 to a wide area network, preferably the Internet. This connection permits users at remote locations to access data in the database on computer system 90. These users may include deedshare brokers, qualified intermediaries, master tenants, deedshare owners, or others who are entitled to access the information in the database. To prevent unauthorized access to data, computer system 90 preferably executes security software as well as the database server application.

Computer system 90 is preferably connected to a local area network, having multiple client computers 95, each of which may be used to access the database on computer system 90. Additionally, printer 96, which may be used for printing database reports or for printing certificates representative of deedshares, is connected to the local area network. Alternatively, printer 96 may be connected directly to computer system 90.

Although preferred illustrative embodiments of the present invention are described above, it will be evident to one skilled in the art that various changes and modifications may be made without departing from the invention. It is intended in the appended claims to cover all such changes and modifications that fall within the true spirit and scope of the invention.

What is claimed is:

1. A method of creating a real estate investment instrument adapted for performing tax-deferred exchanges comprising:

aggregating real property to form a real estate portfolio; encumbering the property in the real estate portfolio with a master agreement; and

creating a plurality of deedshares by dividing title in the real estate portfolio into a plurality of tenant-in-common deeds of at least one predetermined denomination, each of the plurality of deedshares subject to a provision in the master agreement for reaggregating the plurality of tenant-in-common deeds after a specified interval.

2. The method of claim 1, wherein encumbering the property in the real estate portfolio with a master agreement further comprises encumbering the real property with a



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master lease to a master tenant who pays rent to holders of the deedshares.

3. The method of claim 2, wherein creating the plurality of deedshares further comprises structuring the provision to include a put provision that allows holders of the deedshares to force the master tenant to purchase the deedshares at a calculable value after the specified interval and a call provision that allows the master tenant to force holders of the deedshares to sell their deedshares to the master tenant at a calculable value after the specified interval.

4. The method of claim 2, wherein encumbering the real property in the real estate portfolio with a master agreement further comprises including a sublease provision in the master lease, enabling the master tenant to sublease the real estate.

5. The method of claim 2, wherein encumbering the real property in the real estate portfolio with a master agreement further comprises including a maintenance provision in the master lease, requiring the master tenant to maintain the real estate.

6. The method of claim 2, wherein encumbering the real property in the real estate portfolio with a master agreement further comprises including an insurance provision in the master lease, requiring the master tenant to insure the real estate.

7. The method of claim 2, wherein encumbering the real property in the real estate portfolio with a master agreement further comprises including a tax provision in the master lease, requiring the master tenant to pay taxes on the real estate.

8. The method of claim 2, wherein encumbering the real property in the real estate portfolio with a master agreement further comprises including an extended term provision in the master lease, designating that the master lease extends beyond the specified interval.

9. The method of claim 2, wherein encumbering the real property in the real estate portfolio with a master agreement further comprises including a guaranteed rent provision in the master lease, designating that the master tenant pay a predetermined guaranteed income to holders of the deedshares.

10. The method of claim 2, wherein encumbering the real property in the real estate portfolio with a master agreement further comprises including a credit rating provision in the master lease, requiring that the master tenant have a specified minimum credit rating.

11. A method of performing a tax-deferred exchange of investment real estate under §1031 of the Internal Revenue Code comprising:

transferring a first interest in investment real estate having a first value and being subject to a first debt from an exchanger to a third party;

using the third party to transfer title to the first interest in investment real estate to a buyer in exchange for money, proceeds of the transfer of the title to the first interest being held by the third party;

identifying deedshares having a second value equal to or greater than the first value and subject to a second debt equal to or greater than the first debt as a replacement property within a specified number of days of transferring title to the first interest in investment real estate, the deedshares comprising an undivided tenant-in-common interest in investment real estate that is subject to a master agreement including a provision reaggregating title to the investment real estate represented by the deedshares at a specified time;

closing the sale of the deedshares within a second specified number of days of transferring title to the first interest in investment real estate; and

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transferring the deedshares and the second debt from the third party to the exchanger.

12. The method of claim 11, wherein identifying deedshares comprises identifying a combination of deedshares having different predetermined denominations that sum to the second value.

13. The method of claim 11, wherein identifying deedshares further comprises identifying deedshares subject to a master lease to a master tenant, and the master tenant pays rent to owners of the deedshares.

14. The method of claim 13, wherein identifying deedshares further comprises identifying deedshares subject to a provision for reaggregating title that comprises a put provision that allows the owners of the deedshares to force the master tenant to purchase the deedshares at a calculable value on or after the specified time, and a call provision that allows the master tenant to force the owners of the deedshares to sell their deedshares to the master tenant at a calculable value on or after the specified time.

15. The method of claim 13, wherein identifying deedshares further comprises identifying deedshares including a provision enabling the master tenant to sublease the real estate.

16. The method of claim 13, wherein identifying deedshares further comprises identifying deedshares including a provision requiring the master tenant to maintain the real estate.

17. The method of claim 13, wherein identifying deedshares further comprises identifying deedshares including a provision requiring the master tenant to insure the real estate.

18. The method of claim 13, wherein identifying deedshares further comprises identifying deedshares including a provision requiring the master tenant to pay taxes on the real estate.

19. The method of claim 13, wherein identifying deedshares further comprises identifying deedshares including a provision that the master lease extends beyond the specified interval.

20. The method of claim 13, wherein identifying deedshares further comprises identifying deedshares including a provision that requires the master tenant has a specified minimum credit rating.

21. The method of claim 13, wherein identifying deedshares further comprises identifying deedshares including a provision to appoint a real estate broker to sell the real estate after title to the real estate has been reaggregated at the specified time.

22. A method of creating a real estate investment instrument adapted for performing tax-deferred exchanges comprising:

acquiring real property;

encumbering the real property with a master agreement; and

creating a plurality of deedshares by dividing title in the real property into a plurality of tenant-in-common deeds of at least one predetermined denomination, each of the plurality of deedshares subject to a provision for reaggregating the plurality of tenant-in-common deeds after a specified interval.

23. The method of claim 22, wherein encumbering the real property with a master agreement further comprises encumbering the real property with a master lease to a master tenant who pays rent to holders of the deedshares.

24. The method of claim 23, wherein creating the plurality of deedshares further comprises structuring the provision to include a put provision that allows holders of the deedshares

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to force the master tenant to purchase the deedshares at a calculable value after the specified interval and a call provision that allows the master tenant to force holders of the deedshares to sell their deedshares to the master tenant at a calculable value after the specified interval.

25. The method of claim 23, wherein encumbering the real property with a master agreement further comprises including a sublease provision in the master lease, enabling the master tenant to sublease the real property.

26. The method of claim 23, wherein encumbering the real property with a master agreement further comprises including a maintenance provision in the master lease, requiring the master tenant to maintain the real property.

27. The method of claim 23, wherein encumbering the real property with a master agreement further comprises including an insurance provision in the master lease, requiring the master tenant to insure the real property.

28. The method of claim 23, wherein encumbering the real property with a master agreement further comprises including a tax provision in the master lease, requiring the master tenant to pay taxes on the real property.

29. The method of claim 23, wherein encumbering the real property with a master agreement further comprises including an extended term provision in the master lease, designating that the master lease extends beyond the specified interval.

30. The method of claim 23, wherein encumbering the real property with a master agreement further comprises including a guaranteed rent provision in the master lease, designating that the master tenant pay a predetermined guaranteed income to holders of the deedshares.

31. The method of claim 23, wherein encumbering the real property with a master agreement further comprises including a credit rating provision in the master lease, requiring that the master tenant have a specified minimum credit rating.

32. A method of creating a real estate investment instrument adapted for performing tax-deferred exchanges comprising:

acquiring real property;  
encumbering the real property with a master agreement;  
and

using a computer to generate a plurality of deedshares by generating a plurality of tenant-in-common deeds of at least one predetermined denomination that divide title in the real property into a plurality of tenant-in-common interests, each of the plurality of tenant-in-common deeds being subject to a provision in the

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master agreement for reaggregating the plurality of tenant-in-common deeds after a specified interval.

33. The method of claim 32, wherein encumbering the real property with a master agreement further comprises encumbering the real property with a master lease to a master tenant who pays rent to holders of the deedshares.

34. The method of claim 33, wherein using a computer to generate the plurality of deedshares further comprises including in the master agreement a put provision that allows holders of the deedshares to force the master tenant to purchase the deedshares at a calculable value after the specified interval and a call provision that allows the master tenant to force holders of the deedshares to sell their deedshares to the master tenant at a calculable value after the specified interval.

35. The method of claim 33, wherein encumbering the real property with a master agreement further comprises including a sublease provision in the master lease, enabling the master tenant to sublease the real property.

36. The method of claim 33, wherein encumbering the real property with a master agreement further comprises including a maintenance provision in the master lease, requiring the master tenant to maintain the real property.

37. The method of claim 33, wherein encumbering the real property with a master agreement further comprises including an insurance provision in the master lease, requiring the master tenant to insure the real property.

38. The method of claim 33, wherein encumbering the real property with a master agreement further comprises including a tax provision in the master lease, requiring the master tenant to pay taxes on the real property.

39. The method of claim 33, wherein encumbering the real property with a master agreement further comprises including an extended term provision in the master lease, designating that the master lease extends beyond the specified interval.

40. The method of claim 33, wherein encumbering the real property with a master agreement further comprises including a guaranteed rent provision in the master lease, designating that the master tenant pay a predetermined guaranteed income to holders of the deedshares.

41. The method of claim 33, wherein encumbering the real property with a master agreement further comprises including a credit rating provision in the master lease, requiring that the master tenant have a specified minimum credit rating.

\* \* \* \* \*



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(12) **United States Patent**  
**Walker et al.**

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(45) Date of Patent: **\*May 29, 2001**

(54) **CONDITIONAL PURCHASE OFFER  
MANAGEMENT SYSTEM FOR EVENT  
TICKETS**

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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(57) **ABSTRACT**

A system for managing conditional purchase offers is disclosed where an individual searching for a ticket to a particular event may provide a guaranteed purchase offer to a plurality of potential sellers. Various methods and systems for completing such a transaction are also disclosed. An exemplary method includes: making available a guaranteed purchase offer to a plurality of potential sellers; potential sellers examining offers corresponding to a ticket they possess; and a potential seller providing an acceptance to the guaranteed purchase offer. The disclosure describes a method of payment whereby both the buyer and seller must provide credit card pre-authorization to ensure payment and delivery of the ticket. Also, one embodiment discloses a delivery of the ticket that includes the participation of the venue hosting the event. In this embodiment, the traditional practice of exchanging tickets for cash is replaced with an electronic serial number system. According to this system, the venue may be notified to cancel the serial number originally assigned to the ticket held by the seller, and re-assign a new serial number directly to the buyer. The buyer may then exchange this number for a ticket at the venue box office.

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(52) U.S. Cl. .... **705/26; 705/5; 705/13; 705/27; 705/37**

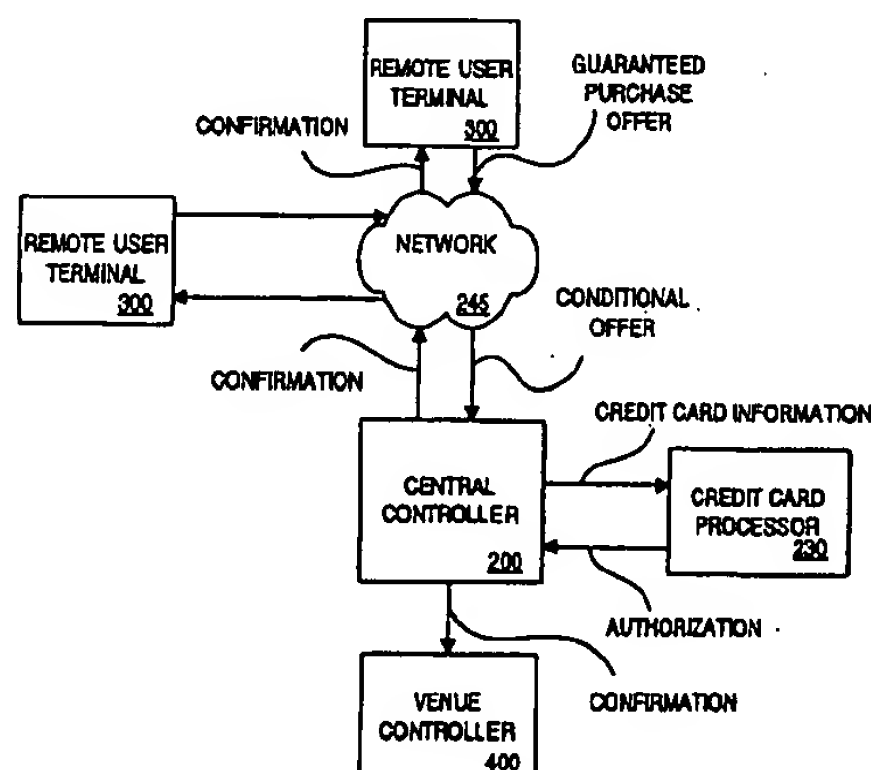
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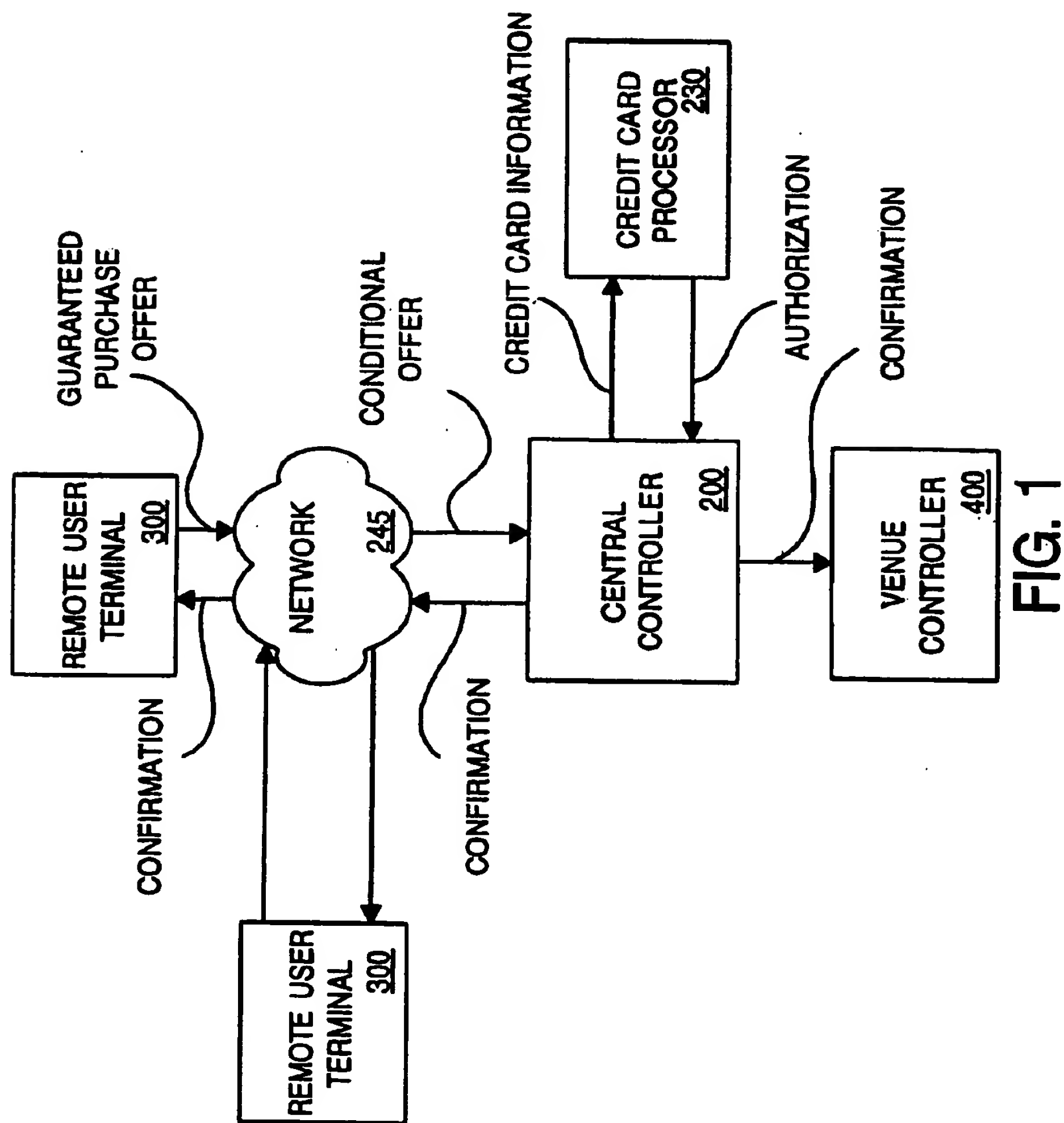
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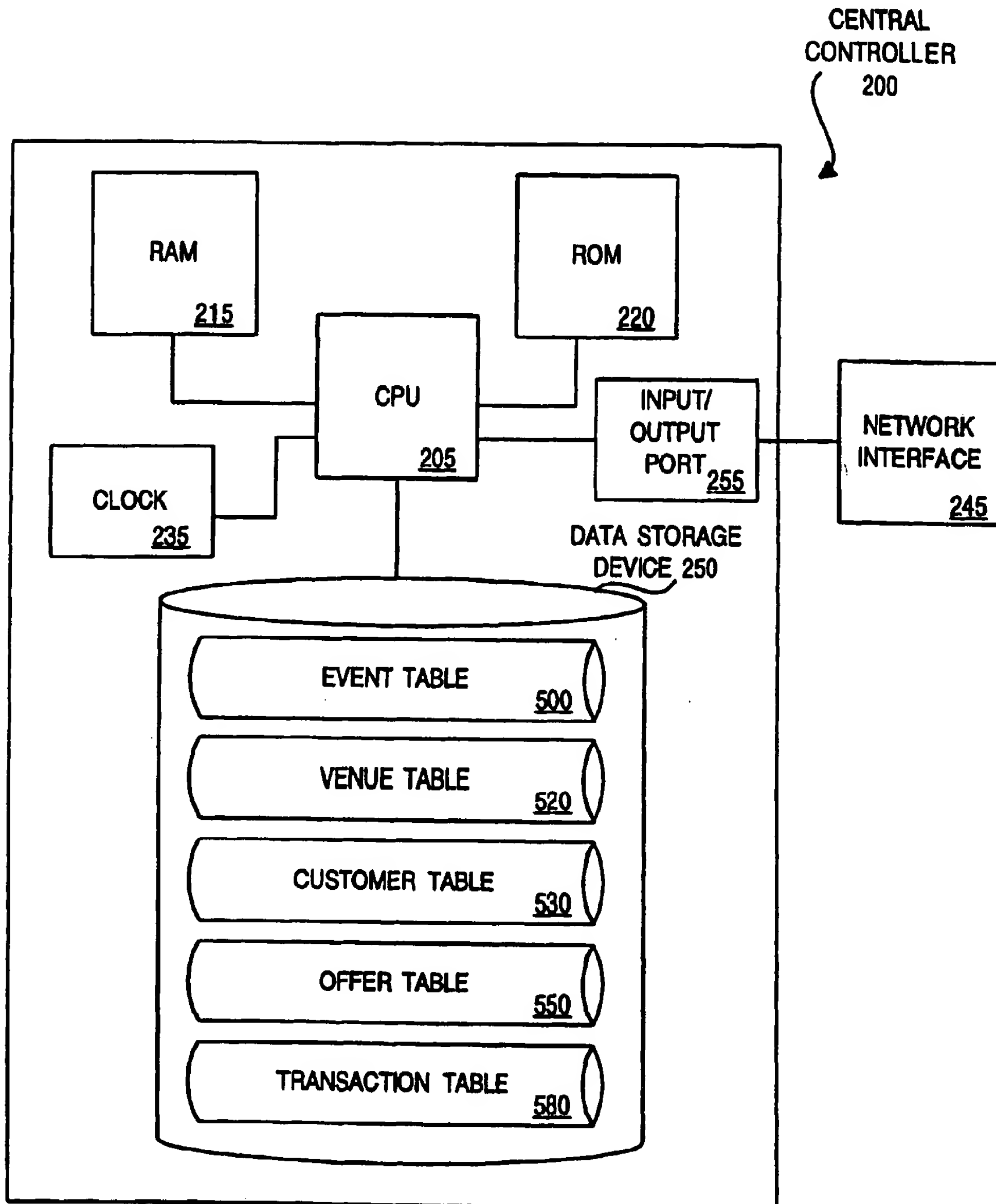


FIG. 2

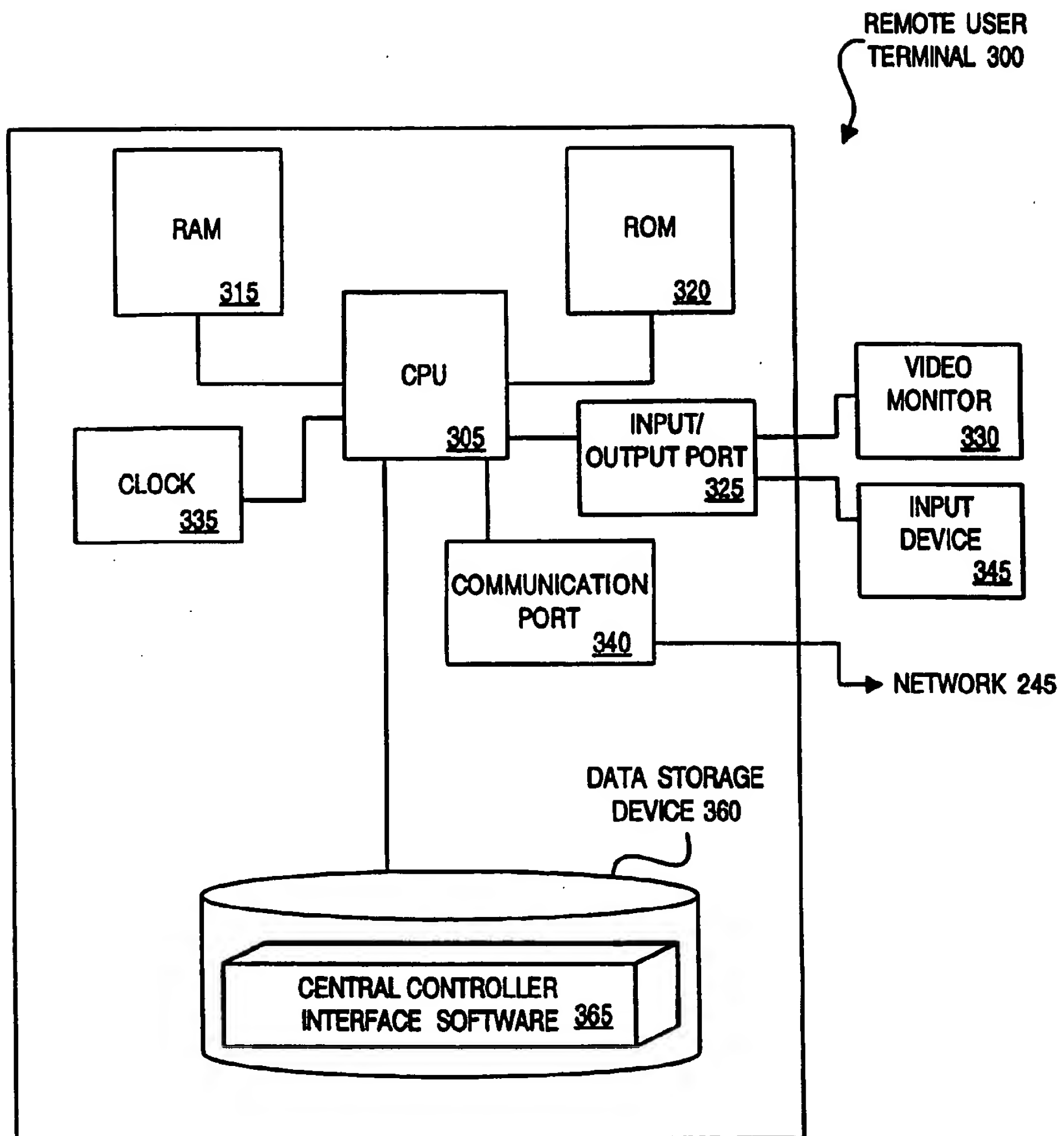


FIG. 3

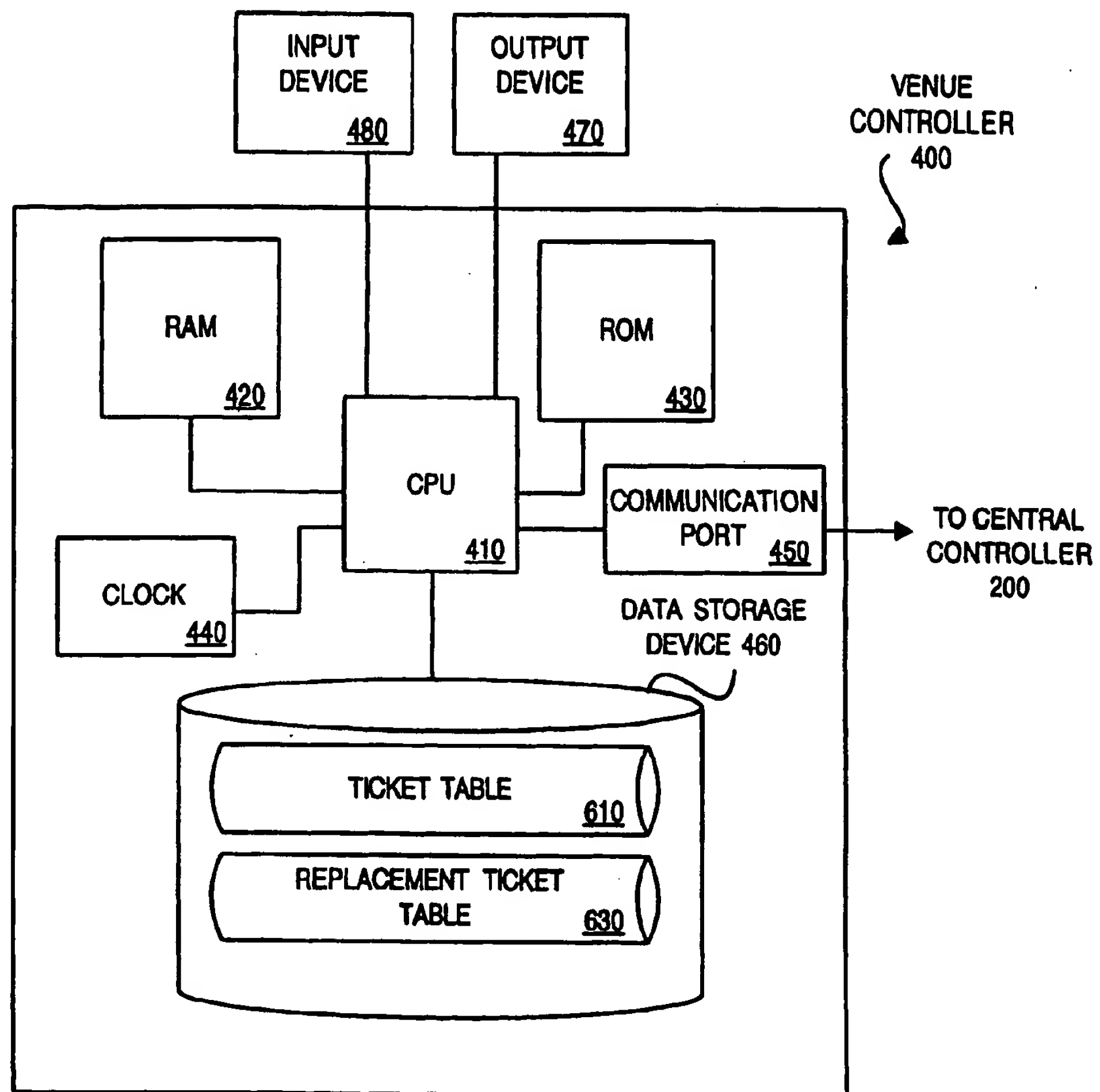


FIG. 4

EVENT TABLE 500



EVENT ID	EVENT TYPE	DESCRIPTION	VENUE ID	DATE	TIME
<u>502</u>	<u>504</u>	<u>506</u>	<u>508</u>	<u>510</u>	<u>512</u>
E001	NHL	NJ DEVILS AT NY RANGERS	MSG	5/6/97	7:30 PM
E002	THEATER	CATS	SCHU	5/11/97	2:00 PM
E003	CONCERT	MICHAEL JACKSON	OMNI	5/12/97	8:00 PM

514

FIG. 5a



VENUE TABLE 520

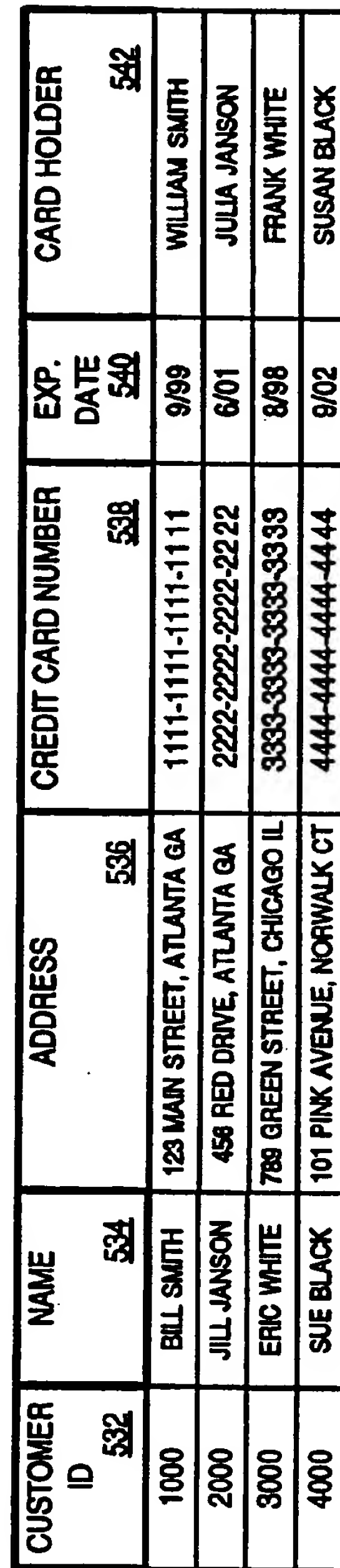


VENUE ID	NAME	ADDRESS
<u>522</u>	<u>524</u>	<u>526</u>
OMNI	OMNI AUDITORIUM	ATLANTA, GA
SCHU	SCHUBERT THEATER	NEW HAVEN, CT
MSG	MADISON SQUARE GARDEN	NEW YORK, NY

528

FIG. 5b

CUSTOMER TABLE 530



The diagram shows a table with five columns: CUSTOMER ID, NAME, ADDRESS, CREDIT CARD NUMBER, and EXP. DATE. The first row is a header row with underlined values. The following four rows are data rows. Arrows point from labels 546 and 548 to the first and fourth data rows, respectively. A curved arrow points from the caption 'CUSTOMER TABLE 530' to the table.

CUSTOMER ID	NAME	ADDRESS	CREDIT CARD NUMBER	EXP. DATE	CARD HOLDER
532	534	536	538	540	542
1000	BILL SMITH	123 MAIN STREET, ATLANTA GA	1111-1111-1111-1111	9/99	WILLIAM SMITH
2000	JILL JANSON	456 RED DRIVE, ATLANTA GA	2222-2222-2222-2222	6/01	JULIA JANSON
3000	ERIC WHITE	789 GREEN STREET, CHICAGO IL	3333-3333-3333-3333	8/98	FRANK WHITE
4000	SUE BLACK	101 PINK AVENUE, NORWALK CT	4444-4444-4444-4444	9/02	SUSAN BLACK

FIG. 5c

OFFER TABLE 550

OFFER ID	CUST ID NUMBER	EVENT ID	OFFER DATE	CLOSE DATE	TYPE	STATUS	QTY	BEGINNING SECTION	BEGINNING ROW	BEGINNING SEAT
551	552	553	554	555	556	557	558	559	560	561
0111	1000	E003	4/1/97	5/12/97	BUY	PENDING	4	001	001	001
0222	3000	E002	3/15/97	5/11/97	SELL	ACTIVE	2	005	005	010
0333	4000	E001	4/20/97	5/6/97	BUY	EXPIRED	4	001	001	001
0444	4000	E001	4/20/97	5/6/97	BUY	FULFILLED	2	001	001	001

570

572

SECTION ENDING	ROW ENDING	SEAT ENDING	PRICE PER UNIT	AUTH. AMT	TRANS ID	LINK ID	TICKET NUMBER(S)
562	563	564	565	566	567	568	569
999	999	999	\$150.00	\$600.00			
005	020	011	\$125.00	\$250.00			4216780 4216790
001	001	999	\$250.00	\$1,000.00		0444	
001	001	999	\$200.00	\$1,000.00	TR001	0333	

FIG. 5d

TRANSACTION TABLE 580

TRANSACTION ID	OFFER ID	ACCEPTANCE DATE	TRANSACTION AMOUNT	BUYER AMOUNT CHARGED	SELLER AMOUNT AUTHORIZED	PROCESSING FEE	DATE TICKETS RECEIVED
<u>581</u>	<u>582</u>	<u>583</u>	<u>584</u>	<u>585</u>	<u>586</u>	<u>587</u>	<u>588</u>
TR001	0444	5/2/97	\$380	\$420	\$400	\$20	

595

SELLER ID	ORIGINAL TICKET NUMBER(S)	NEW TICKET NUMBER(S)
<u>589</u>	<u>590</u>	<u>594</u>
2000	667913, 667914	NT665128 NT665129

FIG. 5e

TICKET TABLE 610

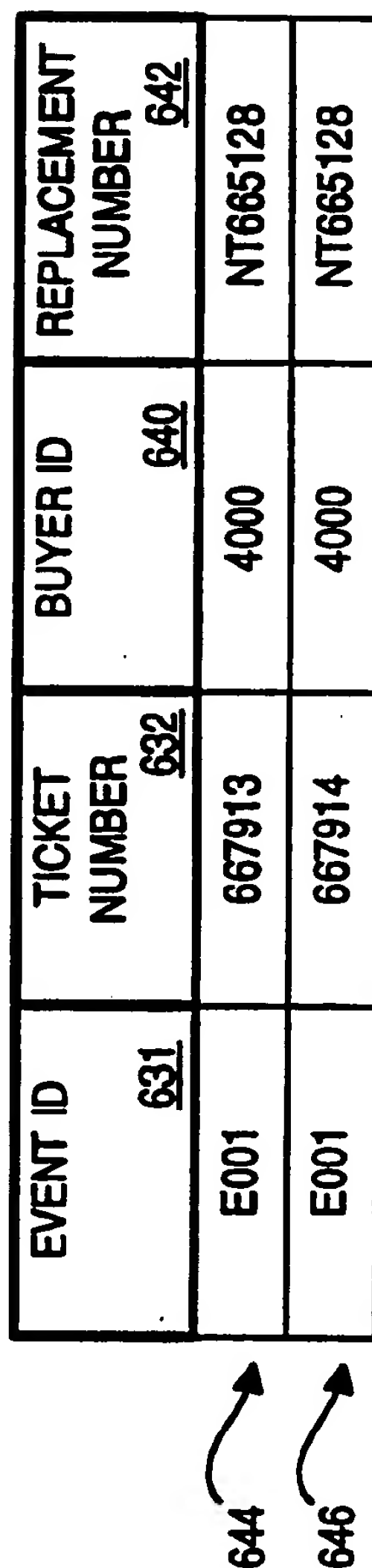
EVENT ID	TICKET NUMBER	SECTION	ROW	SEAT
<u>611</u>	<u>612</u>	<u>614</u>	<u>618</u>	<u>620</u>
E001	667911	001	001	001
E001	667912	001	001	002
E001	667913	001	001	003
E001	667914	001	001	004

622

624

FIG. 6a

REPLACEMENT TICKET  
TABLE 630



EVENT ID	TICKET NUMBER	BUYER ID	REPLACEMENT NUMBER
<u>631</u>	<u>632</u>	<u>640</u>	<u>642</u>
E001	667913	4000	NT665128
E001	667914	4000	NT665128

644

646

FIG. 6b



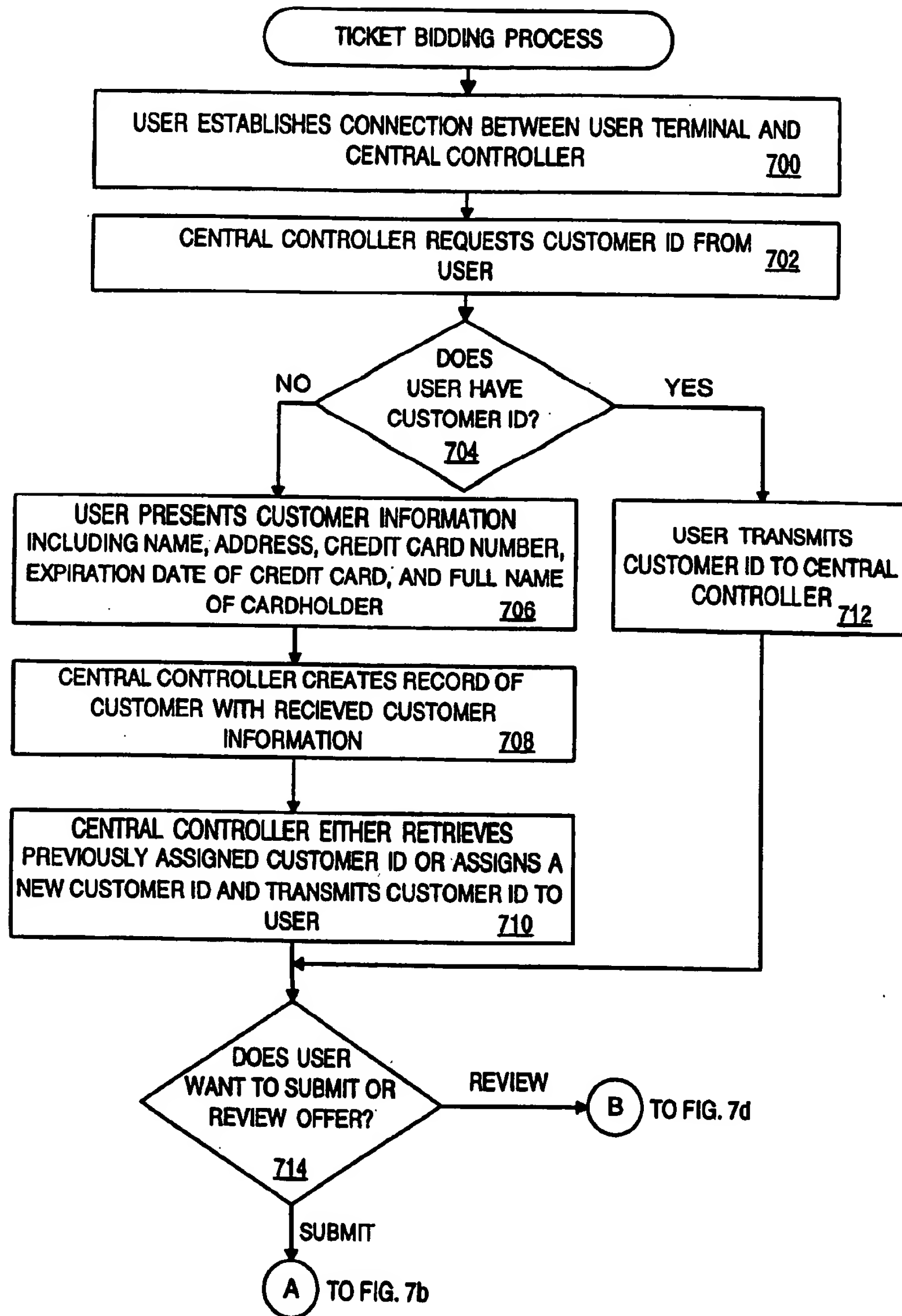


FIG. 7a

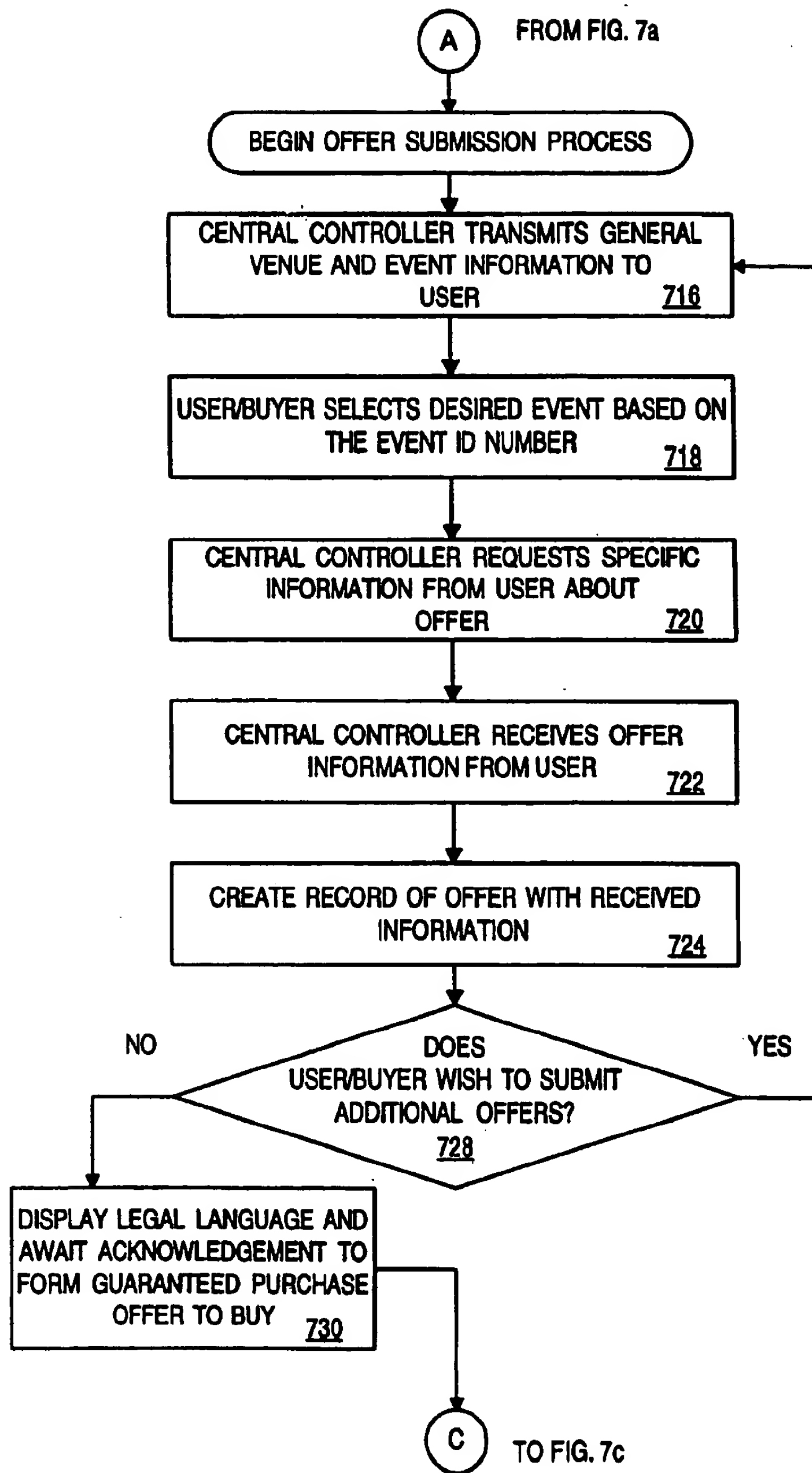


FIG. 7b

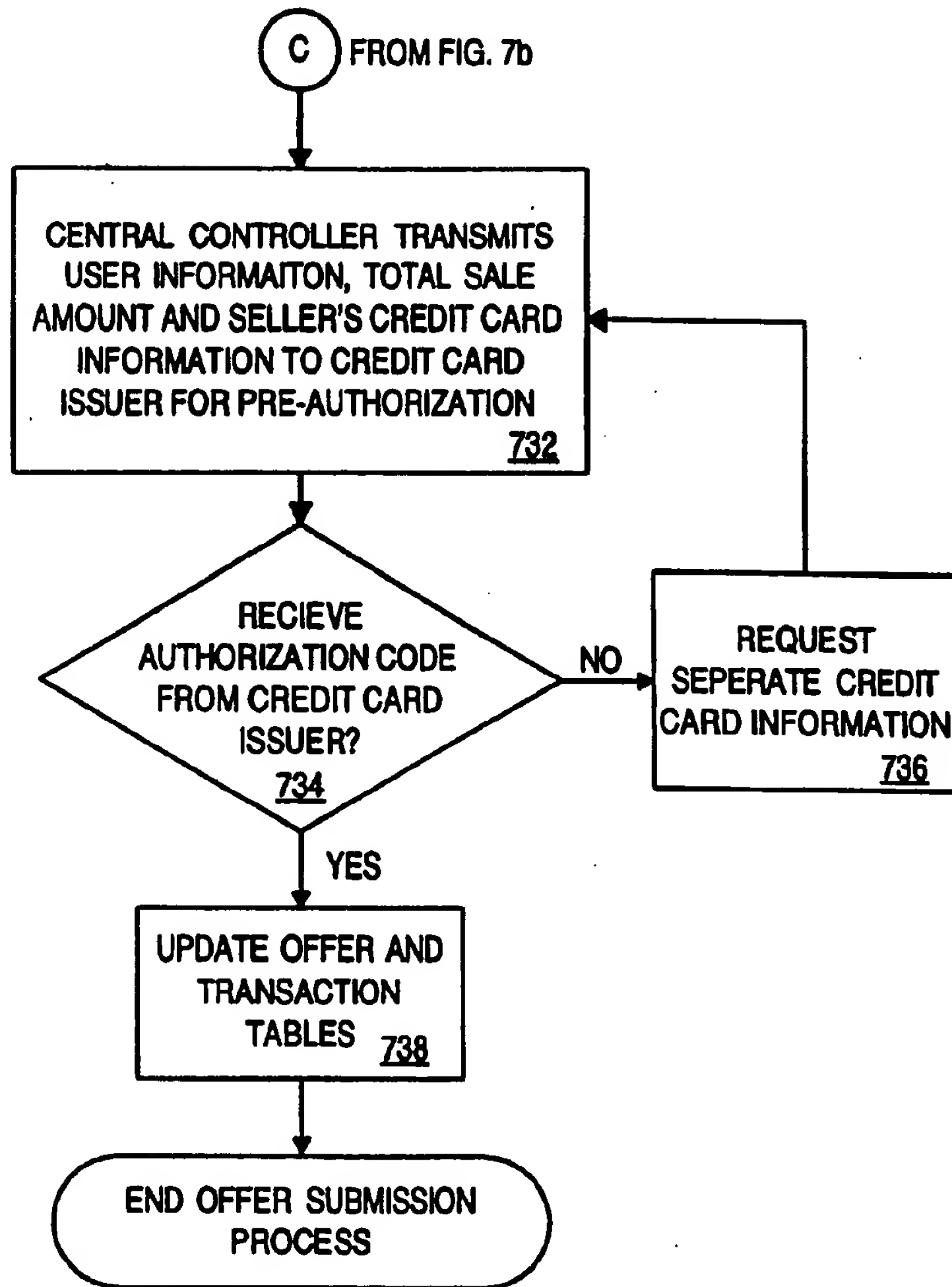


FIG. 7c

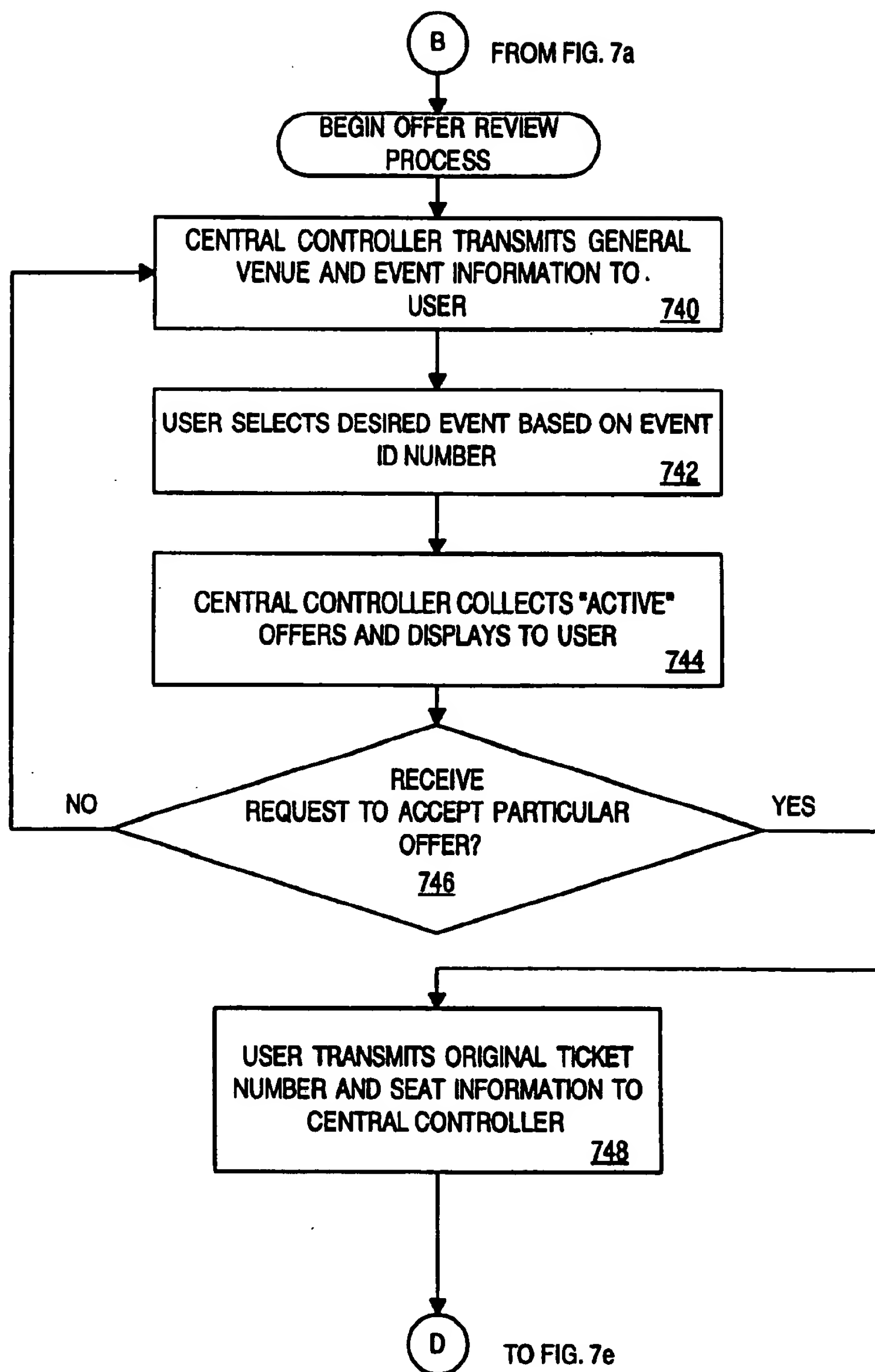


FIG. 7d

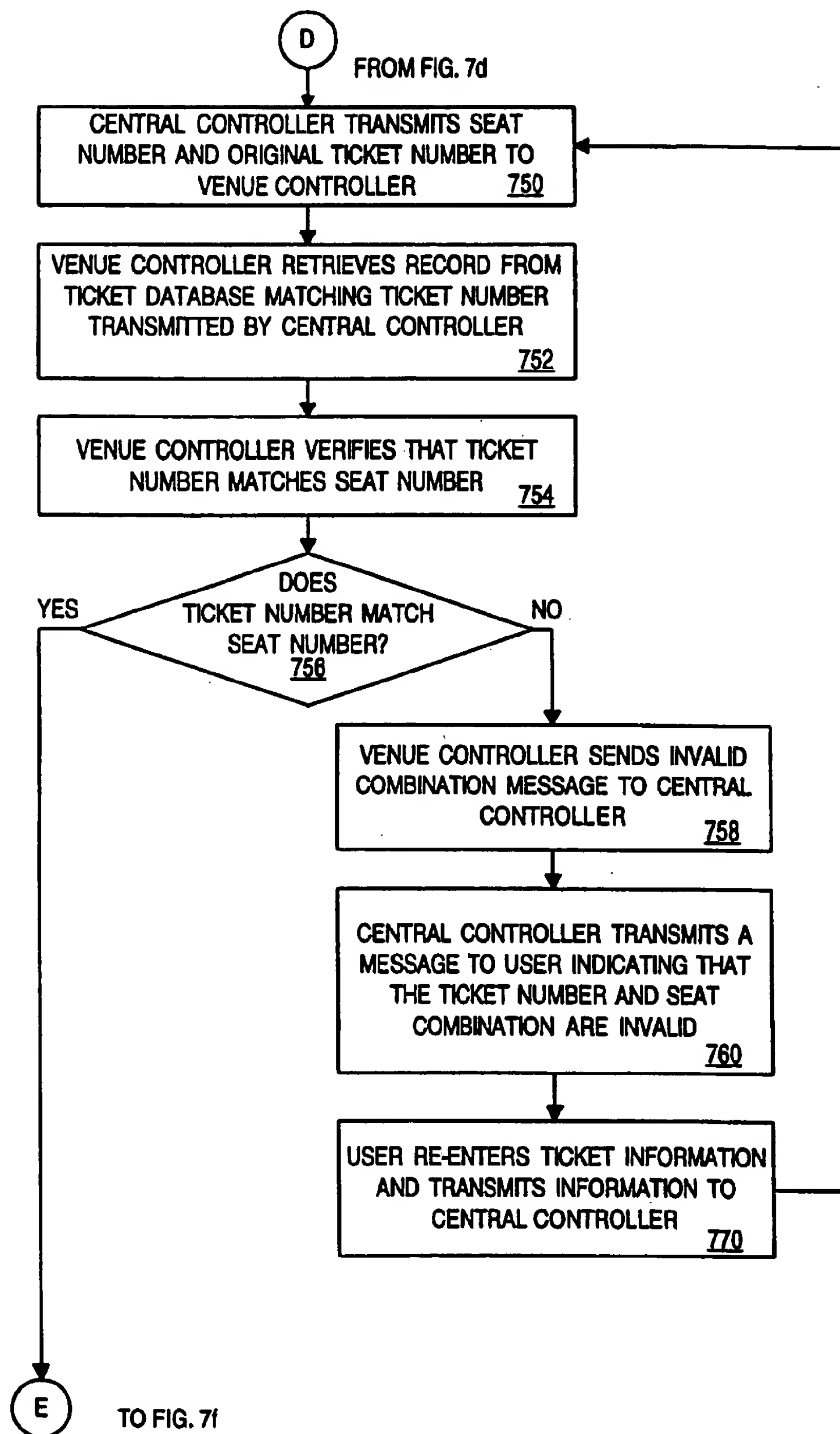


FIG. 7e

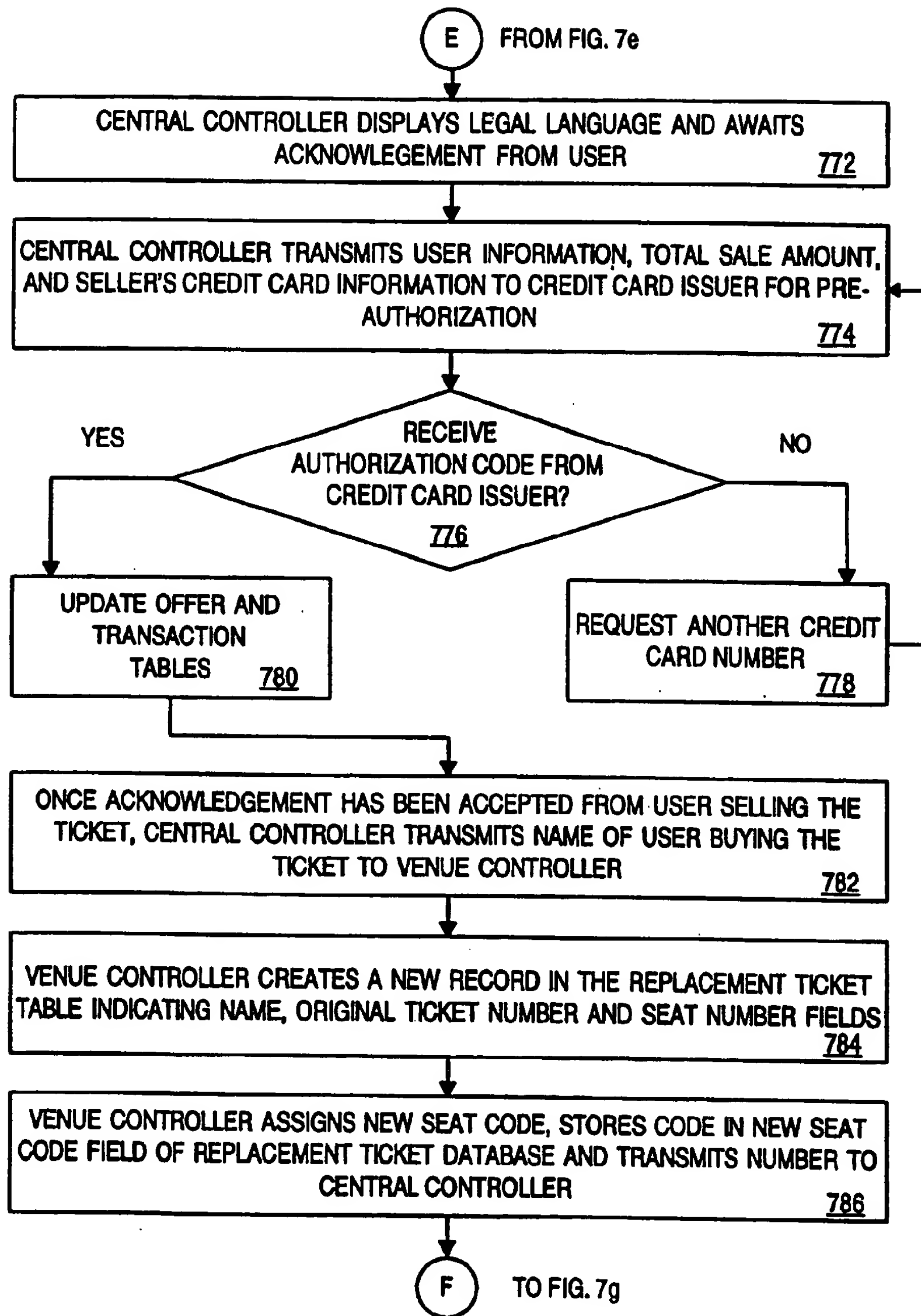


FIG. 7f



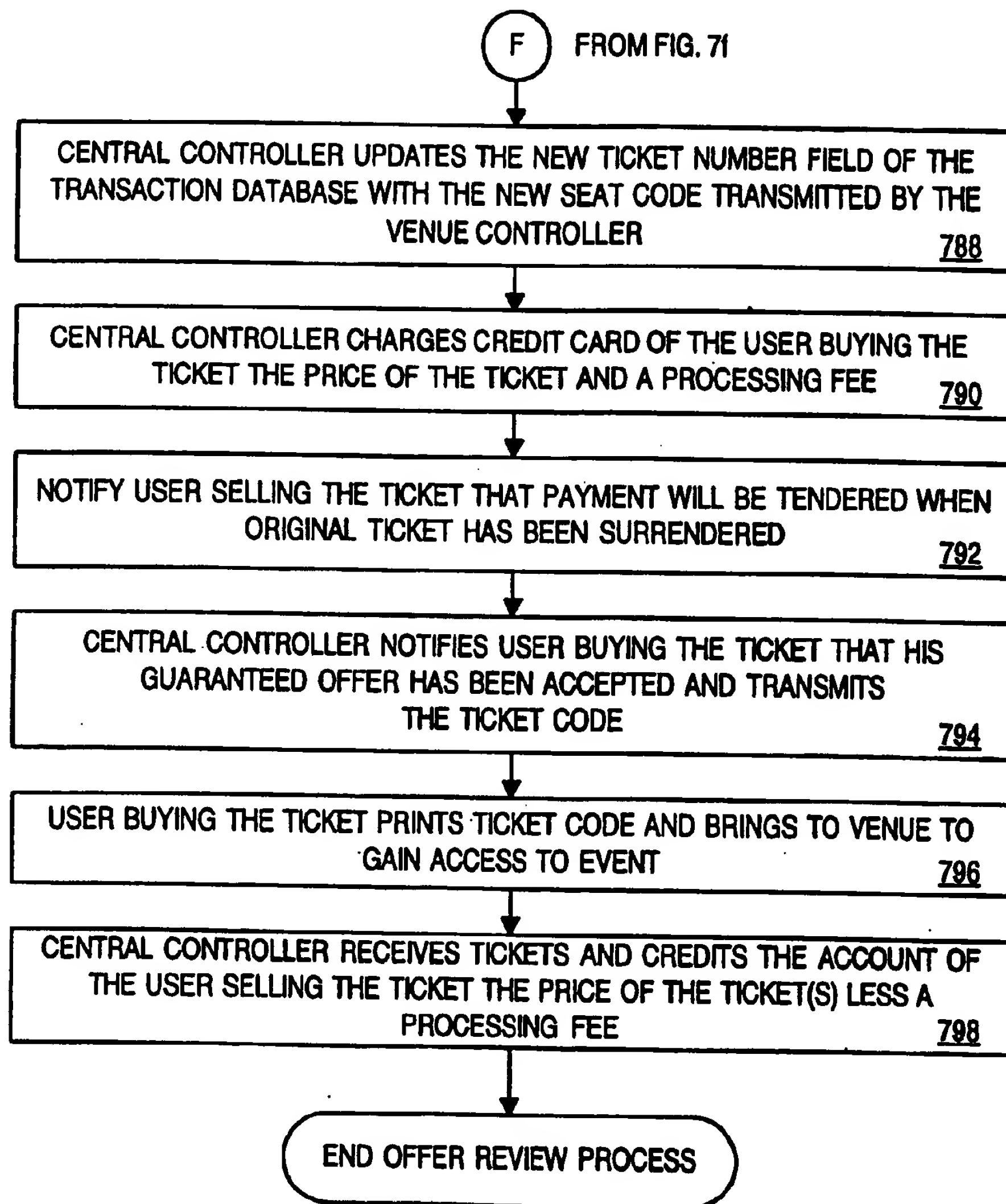


FIG. 7g

# CONDITIONAL PURCHASE OFFER MANAGEMENT SYSTEM FOR EVENT TICKETS

## CROSS-REFERENCE TO RELATED APPLICATIONS

This is a continuation-in-part of U.S. Patent Application Ser. No. 08/889,319 filed Jul. 8, 1997 USP 6,085,169 which is a continuation-in-part of U.S. Patent Application Ser. No. 08/707,660 filed Sep. 4, 1996 USP 5,794,207 and U.S. application entitled "Method and System for Controlling Access to a Venue using Alterable Tickets," U.S. Patent Application Ser. No. 08/916,656 (Attorney Docket No. "WD2-97-052") filed Aug. 22, 1997, each incorporated by reference herein.

The present invention is related to the following United States Patent Applications filed contemporaneously herewith: "Conditional Purchase Offer Management System for Packages," U.S. Patent Application Ser. No. 08/923,317 (Attorney Docket No. WD2-97-065); "Conditional Purchase Offer Management System for Telephone Calls," U.S. Patent Application Ser. No. 08/923,317 (Attorney Docket No. WD2-97-028); "Conditional Purchase Offer Management System for Cruises," U.S. Patent Application Ser. No. 08/923,618 (Attorney Docket No. WD2-97-069); and "Conditional Purchase Offer and Third-Party Input Management System," U.S. Patent Application Ser. No. 08/923,524 (Attorney Docket No. WD2-97-067), each assigned to the assignee of the present invention and incorporated by reference herein.

## TECHNICAL FIELD

This invention relates generally to a method and system for facilitating the remote purchase and sale of tickets, and more particularly, to a method and system for electronically facilitating buying and selling tickets for an event, such as the ballet, theater or a sporting event.

## DESCRIPTION OF THE RELATED ART

Attending an event such as a concert, play, or sporting event generally requires purchasing a ticket in advance. Tickets are traditionally provided by the venue hosting the event and are sold at the venue's box office. Tickets are also available through ticket distributors, in coordination with the hosting venue and the event promoter. Aside from the venue box office, tickets are also available through ticket outlets, ticket brokers, telephone sales, remote ticket printing applications, ticket kiosks and Internet web sites.

It is not uncommon, however, for a venue to sell out quickly for a particular event, whereby available tickets are limited to ticket brokers and "scalpers." For instance, a popular concert may sell out well before many people interested in attending are aware that the original tickets are available. Thus, these individuals are forced to explore the resale market.

Resellers of tickets are limited in their ability to advertise availability to the public. Resellers may rely on classified advertisements in the newspaper, electronic bulletin boards, established contacts or "chat rooms" on the Internet. Also, resellers usually must complete sales either through the mail, or in person.

A number of shortcomings, however, exist for both buyers and sellers in the present resale market. First, the aforementioned methods of advertising are generally neither efficient nor flexible. The cost of advertising often outweighs the marginal profit gained through advertising, particularly for a single ticket. For instance, an advertiser may pay \$30 for a classified ad that results in an additional profit of only \$15. Moreover, advertisements are difficult to remove from the public realm once tickets are resold. Thus, a person selling a ticket may get many telephone inquiries after the ticket has been sold. Further, advertising is especially difficult because many transactions need to be completed just before an event occurs. This is problematic because the buyer requires the ticket to attend the event, and delivering the ticket immediately prior to the event may be difficult. Presently, ticket sellers are often forced to leave tickets at will-call windows or with local proprietors for pick up.

Related shortcomings with the current resale market are timing and delivery. Ticket resellers may not have tickets available until very near to the start time of a particular event, and buyers may not decide to attend an event until shortly before it begins. Specifically, the prior art does not allow substantially immediate efficient consummation of an offer to purchase or sell tickets. Accordingly, there is not a system that solves the problems associated with reselling tickets on the day of the event.

For example, if a person holding a ticket to a hockey game discovers two hours before the game begins that he cannot attend, his options for reselling his ticket are severely limited. His best chance to resell his ticket is to stand outside the arena and hope to find a buyer for the ticket. Such conduct is illegal in most states. Using a similar example, if a person decides he would like to attend that game two hours before it begins, his best option to acquire a ticket is to appear outside the arena and search for a ticket reseller. In both cases, the options presented to both the buyer and the seller are limited to particularly inconvenient and unpredictable ways of purchasing and reselling tickets.

Finally, potential buyers often possess a general distrust of ticket resellers. The act of ticket reselling is often perceived as illegal, and potential buyers are sometimes unhappy about resale prices that are significantly higher than those originally determined by the venue. As a result, buyers simply do not trust ticket resellers, but are often forced to use them as a last resort to purchase tickets. Markups on marquis events can often be as high as 500%. Further, unless a buyer is face-to-face with a ticket reseller, the buyer is typically unwilling to pay for tickets without some assurance of delivery. Likewise, a ticket reseller is typically unwilling to deliver tickets without payment in advance.

## SUMMARY OF THE INVENTION

The problems identified above are solved and a technical advance is achieved by providing, in accordance with the present invention, a system and method for purchasing a ticket for a specified event on a specified date at a specified price.

A method according to the preferred embodiment of the present invention includes: a potential buyer electronically transmitting a guaranteed purchase offer for a ticket to a

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central controller; the central controller electronically making the offer available to a plurality of potential sellers; a first-accepting seller transmitting an acceptance of the offer to the central controller; and the central controller transmitting this acceptance to the buyer along with a code to use at a venue to verify his purchase of the ticket.

Thus, the preferred embodiment of the present invention provides individuals a quick and easy way to purchase a ticket from a ticket reseller, and allows them to avoid the traditional problems of the ticket resale market. Moreover, ticket resellers can sell a ticket based on a guaranteed purchase offer provided by a potential buyer. In addition, the present invention includes mechanisms which prevent fraud both during and after the transaction.

Further aspects of the present invention will become apparent during the course of the following detailed description and by reference to the attached drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic view of a system according to one embodiment of the present invention;

FIG. 2 is a schematic view of a central controller used in the system of FIG. 1;

FIG. 3 is a schematic view of a remote user terminal used in the system of FIG. 1;

FIG. 4 is a schematic view of a venue controller used in the system of FIG. 1;

FIG. 5a is a table illustrating the contents of an event table used in the system of FIG. 1;

FIG. 5b is a table illustrating the contents of a venue table used in the system of FIG. 1;

FIG. 5c is a table illustrating the contents of a customer table used in the system of FIG. 1;

FIG. 5d is a table illustrating the contents of an offer table used in the system of FIG. 1;

FIG. 5e is a table illustrating the contents of a transaction table used in the system of FIG. 1;

FIG. 6a is a table illustrating the contents of a ticket table used in the system of FIG. 1;

FIG. 6b is a table illustrating the contents of a replacement ticket table used in the system of FIG. 1; and

FIGS. 7a-7g are flow diagrams depicting a method of submitting and accepting a guaranteed offer to buy an event ticket over the Internet according to one embodiment of the present invention.

### DETAILED DESCRIPTION

A method and apparatus of the present invention will now be discussed with reference to FIGS. 1-7g. The present invention allows a buyer to present a guaranteed purchase offer for a ticket to a certain event, such as a hockey game, to a number of potential sellers. The sellers may review the offer, and accept the offer if the terms are agreeable. Thus, a buyer may quickly submit an offer to purchase tickets which are guaranteed to be delivered in a safe, convenient manner.

#### System Architecture

With reference to FIGS. 1-6, the system architecture of one embodiment of the apparatus and method of the present

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invention is illustrated. As shown in FIG. 1, the apparatus of the present invention generally comprises a venue controller 400, a central controller 200, a credit card processor 230 and a remote user terminal 300. The remote user terminal 300 is connected to the central controller 200 through a network 245.

Using the above components, the present embodiment of the invention provides a method and apparatus to allow a central controller to facilitate the purchase and sale of event tickets. Specifically, central controller 200 receives and posts offers to purchase tickets for a particular event. Such offers are guaranteed, for example, using a line of credit on a credit card account. Central controller 200 further makes each offer available to a plurality of potential sellers, and allows sellers to accept the offer and thereby form a legally binding contract.

As shown in FIG. 2, central controller 200 includes central processing unit (CPU) 205, random access memory (RAM) 215, read only memory (ROM) 220, clock 235, input/output ("I/O") port 255, and data storage device 250. The data storage device 250 is a memory device containing an event table 500, a venue table 520, a customer table 530, an offer table 550, and a transaction table 580, discussed in greater detail with reference to FIGS. 5a through 5e, respectively.

#### Central Controller Data Tables

FIG. 5a illustrates an exemplary event table 500 that preferably stores information on events for which tickets may be resold using the system of FIG. 1, including location and scheduling information. Event table 500 maintains a plurality of records, such as record 514, each associated with a different event. For each event identifier listed in event ID field 502, event table 500 includes an event type code stored in field 504 and an event description stored in field 506. The event type code stored in field 504 represents the format of the event, for instance, a National Hockey League game is denoted as "NHL." The event description stored in field 506 describes the specific event.

Event table 500 also preferably includes a venue ID stored in field 506. The venue ID stored in field 506 may be utilized, for example, to index venue table 520, more fully described with reference to FIG. 5b. As shown in FIG. 5a, each record stored in event table 500 further includes a date stored in field 510 and a time stored in field 512. The date and time of fields 510 and 512, respectively, represent the starting time of the event associated with the record. The information stored in this table may be supplied to the central controller 200 from any number of sources, including promoters, venues and potential buyers and sellers.

FIG. 5b illustrates an exemplary venue table 520. Each record of venue table 520, such as record 528, preferably stores data associated with and describing a venue. Venue table 520 is preferably indexed by field 522 which stores a unique venue identifier. Venue table 520 further stores a theater, auditorium or stadium name in field 524 and an address in field 526.

FIG. 5c illustrates an exemplary customer table 530 which preferably stores information on each customer registered with the electronic ticket sales system. Customer database 530 maintains a plurality of records, such as records 546 and 548, each associated with a different customer. Customers registered in customer table 530 may buy

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tickets, sell tickets or both buy and sell tickets. Customer table 530 stores a unique customer identifier for each customer in field 532 and name and address information in fields 534 and 536. Preferably, the data maintained in customer table 530 is provided by the customer during a registration process, at which time the customer is assigned a unique customer identifier.

Customer table 530 further stores customer credit card data. The customer's credit card number is stored in field 538. The expiration date of the customer's credit card is stored in field 540, and the name of the cardholder as it appears on the credit card is stored in field 542.

FIG. 5d illustrates an exemplary offer table 550 that preferably stores information relating to offers posted using the ticket sales system of the present embodiment. Offer table 550 maintains a plurality of records, such as records 570 and 572, each associated with an offer to buy or sell tickets. Each record of offer table 550 includes a unique offer identifier stored in field 551 that is assigned by central controller 200 when the offer is posted. Each record of offer table 550 includes fields for identifying the customer making the offer, conditions of the offer, the customer accepting the offer, and administrative information related to the offer.

The customer identifier of the customer extending the offer is stored in field 552. Information relating to the customer extending the offer may be easily obtained using the customer identifier of field 552 as an index into customer table 530. Each record in offer table 550 further stores an event identifier in field 553. The event identifier indicates the event to which the offered ticket(s) relate. Information regarding the event may be easily obtained using the event identifier of field 553 as an index into event table 500.

Each record of offer table 550 further includes fields 554 and 555 that store the date the offer was made and the last day on which the offer may be accepted, respectively. Data indicating an offer type and offer status are also stored in each record of offer table 550 in fields 556 and 557. Field 556 stores a code indicating whether the offer is an offer to buy or an offer to sell one or more tickets. Field 557 stores a code indicating the status of the offer. Offer status possibilities include: pending, active, expired and fulfilled.

Field 558 of each record in the offer table stores the number of seats to which the offer applies. Data identifying the location of seats related to the offer populate fields 559-564. In the event an offer requires a range of seat locations, data stored in fields 559-561 are used to identify the first seat in a range, and data stored in fields 562-564 are used to identify the last seat in a range. Field 565 stores the price per seat.

In addition, each record of offer table 550 includes administrative data in fields 566-569. Data stored in field 566 stores an amount of credit authorized to support the offer. Once an offer has been accepted, field 567 stores a transaction identifier that may be used as an index into transaction table 580, discussed more completely with reference to FIG. 5e. Each record of offer table 550 optionally stores a pointer to a related, or linked, offer record. The pointer is stored in field 568 and represents the offer identifier of the next related record in offer table 550. Finally, field 569 of each record of offer table 550 stores one or more serial numbers of the original tickets that a seller would like to sell.

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Once an offer is accepted, central controller 200 adds a transaction record to transaction table 580. FIG. 5e illustrates an exemplary transaction table 580 that preferably stores information relating to each accepted offer. Each accepted offer is assigned a unique transaction identifier that is stored in field 581 of transaction table 580 and field 567 of offer table 550. An offer identifier of an associated record in offer table 550 is stored in field 582. This offer identifier may be used as an index into offer table 550 to retrieve information regarding the offer associated with a transaction record.

Each record of transaction table 580 preferably further includes field 583 which stores the date the associated offer was accepted and field 584 which stores the total value of the transaction. Field 585 stores the amount charged to the buyer's credit card; field 586 stores the amount of the seller's credit line reserved to support the acceptance; and field 587 stores the fee charged for processing the transaction. Each record of transaction table 580 also stores a date in field 588 indicating the date the ticket(s) are received by the operator of central controller 200.

The customer identifier of the seller is stored in field 589, and data identifying the ticket(s) is stored in fields 590 and 594. Field 590 stores the original ticket number(s), and field 594 stores new ticket number(s). The new ticket numbers are assigned to distinguish original tickets from resold tickets and promote efficient resolution of potential conflicts between ticket holders.

Optionally, central controller 200 may include a contract detail table (not shown) containing form contract provisions which the central processor 200 retrieves and transmits to users at various times. For example, the contract table may include a contract provision that is transmitted to a buyer and incorporated into the guaranteed purchase offer. The contract table may also include a contract provision which is transmitted to a seller prior to requesting an acknowledgment of his intent to bind a buyer's offer and create a legally binding contract. These form provisions effectively fill the gaps between conditions specified by the buyer, specifying the generic contract details common to most contracts of this nature.

#### User Terminal

Referring now to FIG. 3, remote user terminal 300 will now be described in greater detail. Remote user terminal 300 can be a personal computer, screenphone, stand alone kiosk, or any other device through which a customer can access the central controller 200. Remote user terminal 300 generally includes a central processing unit ("CPU") 305 that controls the operation of remote user terminal 300. CPU 305 is electronically connected to a random access memory ("RAM") 315, a read only memory ("ROM") 320, an input/output port 325, a clock 335, a communication port 340 and a data storage device 360. CPU 305 receives inputs from a remote user with the input/output port 325 and an input device 345, such as a keyboard. CPU 305 transmits outputs to a remote user via the input/output port 325 and a video monitor 330. Further, the communication port 340 provides the communication path to network 245. Finally, the data storage device 360 is a memory device containing central controller interface software 365.

#### Venue Controller

Referring now to FIG. 4, venue controller 400 will now be described in greater detail. Venue controller 400 generally



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includes a central processing unit ("CPU") 410 that controls the operation of venue controller 400. The CPU 410 is electronically connected to a random access memory ("RAM") 420, a read only memory ("ROM") 430, a clock 440, a communication port 450 that provides a communication path to central controller 200, and a data storage device 460. Data storage device 460 is a persistent memory device containing a ticket table 610 and a replacement ticket table 630. Venue controller 400 further includes input device 480 for receiving input data and output device 470 for presenting or displaying information to an operator.

FIG. 6a illustrates an exemplary ticket table 610 that preferably stores information about tickets issued for various seats at a particular venue. Each ticket has a specific ticket number assigned to it by venue controller 400 prior to issuance. Each record of ticket table 610 preferably includes field 611 that identifies the event for which the ticket is valid, field 612 that identifies the number assigned to each ticket issued for an event, and fields 614-620 that represent the location of the seat in the auditorium (i.e. the section, row and seat, respectively). Ticket table 610 could also contain fields representing other information specific to a venue, an event, or a seat.

FIG. 6b illustrates an exemplary replacement ticket table 630 that preferably stores data relating to original ticket numbers that have been voided and assigned replacement ticket numbers. Replacement ticket table 630 stores the ticket numbers that have been resold by the central controller 200 in field 632 and stores the replacement ticket numbers in field 642. Each record of ticket table 630 further includes a field 631 that stores an event identifier and a field 640 that stores a buyer identifier.

It will be recognized by one of ordinary skill that the present invention could be constructed and operated without the illustrated distributed processing architecture. If venues and ticket distributors so desired, central controller 200 could incorporate all or part of the database of venue controller 400 and perform all or part of the processing steps performed by venue controller 400 in the present embodiment. In such an alternate embodiment, data processing and data storage could be centralized, and venues could access the data as appropriate using conventional remote terminals or work stations.

#### Online Embodiment

In one embodiment of the present invention, communications between potential buyers and sellers take place via an electronic or digital network, such as the Internet, with central controller 200 hosting an Internet web site that users can access or "log on" to by means of a personal computer. It is important to note that users can access the central controller via other communications links such as a conventional telephone line linked to a voice response unit ("VRU").

To use the ticket reselling service, a user who is a potential buyer logs on to central controller 200 through network 245, creates and submits a guaranteed purchase offer, and disconnects from the network 245. In one embodiment, a guaranteed purchase offer is a legally binding offer to purchase tickets that is backed by a pre-authorized credit card transaction. Upon receiving the offer, central controller 200 contacts the buyer's credit card issuer to ensure that the buyer has a valid credit card account and/or sufficient credit

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to pay for the requested tickets. The guaranteed purchase offer is then made available to potential sellers by posting the offer using the web site linked to central controller 200. Periodic maintenance is performed by central controller 200 to ensure that "active" offers have not expired. A potential seller can use the system of the present invention to browse offers and submit an electronic acceptance of a desirable offer. The acceptance by the potential seller is transmitted electronically to central controller 200. Central controller 200 processes the acceptance and contacts the seller's credit card issuer to ensure that there is sufficient credit to cover a potential penalty for non-performance. This reservation of the seller's credit is intended to promote trust between the parties and, thereby, protect the transaction. After verifying available credit, both parties are notified of the binding transaction, and the tickets are electronically voided and assigned a replacement ticket number. The seller is then required to surrender the voided tickets. This may be accomplished by returning them to the venue, or the seller may mail the tickets to the operator of central controller 200. Upon receiving the surrendered tickets, the operator of central controller 200 directs payment to be transferred to the user selling the tickets.

With reference to FIG. 7a, a process by which a user logs on and begins using the system will now be described. As shown in step 700, a user operating a remote terminal 300 establishes a connection with the central controller 200 through network 245. The user may be either a potential buyer wishing to place a guaranteed purchase offer for tickets, or a potential seller wishing to review offers for tickets.

At step 702, central controller 200 requests a customer ID from the user. At step 704, central controller 200 determines how to proceed based on whether or not the user already has a customer ID. If the user is registered with this service, and remembers his customer ID, he transmits his customer ID to central controller 200 at step 712, and the process continues with step 714.

If, on the other hand, the user is not registered with the service, or does not remember his customer ID, he must submit a negative response at step 704 and present relevant customer information to central controller 200, as shown by step 706. At step 708, central controller 200 creates a record of the customer based on the received customer information. This information, including name, address, credit card and number, expiration date, and name as it appears on the credit card, is stored in customer table 530. At step 710, central controller 200 compares the information provided by the user with information already stored in customer table 530. If a match is found, central controller 200 retrieves the customer ID from field 532 of customer table 530, and transmits the customer ID number to the user. This service is provided for users who have given information previously, but do not remember their customer ID number. If no match is found, the central controller 200 assigns a new customer ID to the user, stores it in field 532 of customer table 530, and transmits it to the user.

At step 714 the user indicates whether he would like to submit a guaranteed purchase offer, or review offers from potential buyers. The process steps relating to submitting offers are described more fully with reference to FIGS.

7b-7c. The process steps relating to reviewing offers are described more fully with reference to FIGS. 7d-7g. In an alternative embodiment, the user could also elect to advertise the availability of tickets for a certain event to potential buyers. Furthermore, a user could elect to review such advertisements, to get a better understanding of what a fair price might be, prior to submitting an offer.

FIGS. 7b and 7c illustrate the process steps executed following the user's choice at step 714 to submit a guaranteed purchase offer. At step 716, the central controller transmits general venue and event information to user terminal 300 for display to the user. For instance, in one embodiment, central controller 200 may provide a number of options to the user in order to pinpoint the specific event that the user would like to attend. The user could directly request a particular event, or proceed through a group of narrowing choices to ultimately find the right event. A user, for example, may be asked to identify any of the fields from event table 500. Depending on the amount of information provided, the choice of events will be narrowed accordingly. For instance, if the user provides only the event type (e.g. "NHL"), central controller 200 scans the event table 500 and provides all matches found in the event type field 504. This may be a long list of events, however, central controller 200 may prompt the user for more information to narrow the list. The user may then select from the narrow list to find the event for which he is looking. For example, the user may specify only Saturday matinee performances of a particular Broadway production in order to narrow the list. Central controller 200 then provides the user with the correct event information, including the event ID from field 502 of the event table 500. The user includes this event ID as part of their guaranteed purchase offer so that it may be tracked by central controller in the offer table 550.

Next, at step 718, the user selects the desired event based on the event ID number. At step 720, central controller 200 requests certain information from the user pertaining to the offer, such as

- (1) the number of tickets desired;
- (2) the price for each ticket;
- (3) the location desired for each ticket; and
- (4) optionally, a date through which the offer is valid.

The user indicates the number of tickets he would like and the price he is willing to spend, based on the particular location of the tickets. The user may choose the exact location of seats that correspond to the price he is willing to pay using a graphical representation of the venue. For instance, based on the venue ID number (stored in field 522 of venue table 520), central controller 200 retrieves from memory and provides to the user at remote user terminal 300 a graphical representation of seating at that particular venue. In one embodiment, central controller 200 first provides a broad general outline of the entire venue (e.g., display by sections). The user can then click on a particular area to narrow his search for exact seats. With each successive selection click, the display screen at user terminal 300 narrows the scope of displayed seating until the user finds the seats he desires. The user can then select the group of seats which corresponds to the purchase offer. Central controller 200 stores the selected seats in fields 559-564 of the offer table 550. If the user prefers to select one section or

multiple sections instead of specific seats, he can enter a range of selections. Central controller 200 then stores this broader selection by only using the section fields 559 and 562, and leaving the other four fields empty.

Further, the user may provide a close date to denote a date on which the offer expires. As previously discussed, central controller 200 periodically reviews this close date, and changes the status of the offer to "expired" in field 557 of the offer table 550 once the date has passed.

At step 722, central controller 200 receives the offer information transmitted by the user, and as shown in step 724, central controller 200 creates a record of the offer in offer table 550. At step 728, the user is asked if he would like to make additional offers. At this point, if the user would like to make an offer for a separate event, he may go through the same process discussed in steps 716-724. However, if the user would like to make a related, or linked offer to the offer previously provided, they may do so as follows. First, in one embodiment they provide the same event ID as at step 718. Next, after submitting the same general information previously discussed, the user indicates that this offer is linked. The central controller then assigns the offer ID number created for the initial offer as the link ID number for the related offer, and stores in the link ID field 568 of the offer table 550.

A user might provide a linked offer based on the type of seat desired. For instance, the user might select a number of the "high quality" seats in a particular venue, and offer a higher purchase price. The linked offer would include "lower quality" seats for a particular venue, perhaps at a lower purchase price. Thus, based on the link ID, potential sellers will consider both offers together during their review.

Also, the user may link offers for two separate events as opposed to the same one. For example, instead of linking offers based on seat selection and price, the user may prefer to attend one of two events in the local area, but not both. Thus, he could link these offers so that potential sellers would be made aware that the offers were conditioned against an "either/or" proposition.

The central controller 200 assigns an offer ID number to each offer in the offer ID field 551, and assigns this number as the link ID number for linked offers in link ID field 568. Also, the offer date field 554 is populated with a timestamp (e.g., date and time) indicating when the offer was posted. Next, central controller 200 assigns the value "pending" to the status field 557. This value will change to "active" upon receipt of authorization from the user's credit card issuer. Further, central controller 200 calculates the authorized amount, and stores it in authorized amount field 566. The authorized amount field represents the amount of the user's credit which is reserved to "back up" the offer and is usually equal to the total transaction amount. By reserving a portion of the user's credit, the ticket seller and ticket service can be guaranteed that they will receive payment if the offer is accepted. In case of linked offers to buy, the authorized amount is the highest transaction amount of the linked offers. When a linked offer is accepted, the system automatically considers all related offers to be withdrawn. Finally, central controller 200 stores all the information provided by the user, including the seat location based on the graphical representation of the venue, in the respective fields of the offer table 550.



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At step 730, the central controller 200 extracts legal contract language from the contract detail table (not shown) and transmits to the user at user terminal 300. This language describes the legal implications of offering the guaranteed purchase offer, and the process is similar to reviewing terms before signing a written contract. If the user elects not to abide by these terms, he may cancel the offer. However, if the user does elect to abide by the terms, the user transmits a positive acknowledgment to central controller 200, and is legally bound to the terms of the guaranteed purchase offer.

In FIG. 7c, central controller 200 then contacts the user's credit card issuer at step 732 to receive authorization for the offer. First, central controller 200 collects the user name, address, credit card type, credit card number, and expiration date from customer table 530, based on the customer ID from the offer table 550. This information along with the authorization amount from field 566 of the offer table 550 is transmitted to the credit card issuer through credit card processor 230.

At step 734, the central controller 200 receives either an authorization or rejection from the credit card issuer through credit card processor 230. The credit card issuer may reject the request for any number of reasons, including an expired card, overextended credit limit, or delinquency in payments. Upon rejection, at step 736 central controller 200 notifies the user at user terminal 300 of this rejection and requests separate credit card information. Alternatively, the user may transmit information corresponding to a separate credit card, which supplements or replaces his present information in the customer table 530. If alternative credit card information is provided, step 732 is repeated in order to receive authorization for the charge. Upon receiving authorization from the credit card issuer through the credit card processor 230, central controller 200 updates offer table 520, including changing status field 557 to "active" to confirm the posted offer.

FIGS. 7d-7g illustrate the processing steps executed based on the user's choice at step 714 to review offers from potential buyers. At step 740, central controller 200 transmits general venue and event information to user terminal 300 for display to the user. As discussed earlier at step 716, central controller 200 may provide a number of options to the user to identify the exact event the user wishes to review. Ultimately, central controller 200 provides the user with the event ID from field 502 of the event table 500. At step 742, the user supplies the event ID to central controller 200 so it may identify associated offers in offer table 550.

At step 744, central controller 200 identifies offer records associated with the selected event ID and having an "active" status. Central controller 200 transmits this data to user terminal 300 for display to the user. The user may review all offers for the specific event together, or one at a time. In one embodiment, the user may review each individual offer through a graphic display of the venue, to pinpoint exactly where the buyer is requesting seats. In some cases, the offer may be for seats anywhere in the entire arena. In others, the offer may only be for a specific range of sections, rows or seats. In one embodiment, the user may be able to enter their exact ticket information to confirm whether it meets the requirements of the offer.

As previously discussed, linked offers will be appropriately identified upon presentation to the user. In this case,

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central controller 200 allows associated linked offers to be reviewed simultaneously, so that the user can compare the conditional offers submitted from a single buyer.

Next, at step 746, central controller 200 receives either a request to accept a particular offer, or a request to review offers for other events. In the latter case, steps 740, 742 and 746 will be repeated. It should be noted that the user may exit the system at any time prior to accepting an offer.

After the user transmits a request to accept a particular offer, at step 748 the user transmits the original ticket number and seat location (i.e. section, row and seat) to central controller 200. Upon receiving this information from the user, central controller 200 at step 750 transmits the original ticket number and seat location to the venue controller 400 for verification of the ticket's validity.

Referring now to FIG. 7e, at step 752 venue controller 400 retrieves a record from ticket table 610 matching the ticket number transmitted by central controller 200 in step 750. Venue controller 400 verifies that the transmitted ticket number matches the transmitted seat location at steps 754 and 756. If the transmitted ticket and seat location do not match, at step 758, venue controller 400 transmits an invalid combination message to central controller 200. Central controller 200 then transmits a message to user terminal 300 indicating that the ticket number and seat location are an invalid combination at step 760. Upon receiving the invalid combination message at user terminal 300, the user can resubmit the ticket and seat location to central controller 200 at step 770. The process then loops back to step 750. If the ticket number and seat location combination is valid, the process continues with step 772.

At step 772 of FIG. 7f, central controller 200 transmits to user terminal 300 legal contract language which is displayed to the user selling his ticket. As previously indicated, this contract language may be stored in a contract detail table (not shown). This language describes the legal implications of accepting the guaranteed purchase offer, and the process is similar to reviewing terms before signing a written contract. If the user selling his ticket elects not to abide by these terms, the user may cancel his acceptance. However, if the user elects to abide by the terms, the user transmits a positive acknowledgment to central controller 200, and is legally bound to the acceptance.

Central controller 200 then contacts the user's credit card issuer at step 776 to receive authorization for the acceptance. Central controller 200 requests authorization from the credit card issuer to reserve a portion of the user's credit based on the offer information and credit information collected from the user at step 706 and stored in customer table 530. This credit reservation is a fraud deterrent and may be used as a penalty in the event the seller fails to deliver the tickets. Such a penalty creates buyer confidence and provides assurance to a user buying the ticket that the user selling the ticket will, in fact, relinquish the tickets. The penalty could be paid to the user buying the ticket if the user selling the ticket attempts to repudiate the agreement. This penalty may be determined in a number of ways including imposing a flat penalty on the user selling the ticket or imposing a penalty equal to the entire amount offered by the user buying the ticket.

At step 774, central controller 200 collects information from the user selling the ticket. The information may include

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the user name, address, credit card number and expiration date from customer table 530, based on the customer ID retrieved from the offer table 550. This information, along with the authorization amount from field 566 of the offer table 550, is transmitted to the credit card issuer through credit card processor 230.

At step 776, central controller 200 receives either an authorization or rejection from the credit card issuer through credit card processor 230. The credit card issuer may reject the request for any number of reasons, including an expired card, overextended credit limit, or delinquency in payments. Upon rejection, at step 728 central controller 200 notifies the user at user terminal 300 of the rejection and requests alternate credit card information. The user may attempt to transmit the same credit information as provided earlier, because the user may have mistakenly transmitted incorrect information earlier. Alternatively, the user may transmit information corresponding to an alternate credit card, which will supplement or replace the credit card information in customer table 530. Further, the user could cancel the transaction altogether. If alternative credit card information is provided, step 774 is repeated in order to receive authorization for the charge.

If central controller 200 receives authorization from the credit card issuer through credit card processor 230, the process continues with step 780 wherein central controller 200 generates and assigns a transaction ID to the sale. This transaction ID is stored in field 567 of the offer table 550. Further, central controller 200 creates a new record in transaction table 580, indexed by the assigned transaction ID. The assigned transaction ID is also stored in field 581 of transaction table 580. The original ticket number 590 field of transaction table 580 is populated with the appropriate ticket number(s) from the user selling the ticket. Further, central controller 200 timestamps the acceptance using date field 583 indicating when the acceptance was posted.

Once the guaranteed purchase offer has been accepted, central controller 200 uses the customer ID from field 552 as an index into customer table 530 to retrieve the name of the user buying the ticket. At step 782, central controller 200 transmits the name of user buying the ticket to the venue controller 400.

At step 784, venue controller 400 creates a new record in replacement ticket table 630. The new record is populated with information indicating the buyer's name, the original ticket number, the section, row and seat of the ticket. As shown at step 786, the new record is further populated with a replacement ticket number assigned by venue controller 400. The replacement ticket number is then transmitted to central controller 200.

Once central controller 200 has received the replacement ticket number 642 from venue controller 400, central controller 200 then updates the new ticket number field 594 of transaction table 580 at step 788. At step 790, central controller 200 determines the payment due and charges the credit card, of the user buying the ticket, the price of the ticket plus a processing fee 587. Central controller 200 also updates field 585 of the transaction table 580 with the amount charged. Finally, central controller 200 updates field 589 with the seller ID of the user accepting the offer, and central controller 200 updates field 586 with the seller

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amount authorized in the event that the seller tries to use his sold ticket. Field 584 is updated based on buyer amount charged 585 less the processing fee 587. Although fees of the present embodiment are illustrated as being stored in a table, such fees could easily be calculated instead of being retrieved from a table.

At step 792, central controller 200 transmits a message to user terminal 300 to notify the user selling the ticket that it will credit his credit card account with the sale amount of the ticket as soon as central controller 200 receives verification that the original tickets have been surrendered.

At step 794 the central controller transmits replacement ticket number 692 and a message to the user buying the ticket indicating that his guaranteed offer has been accepted. The user buying the ticket may then print the replacement ticket number, take it to the venue and use it to gain access to the desired event, at step 796. The cancellation of the original number and issuance of a replacement ticket number tied to the purchasing user's name is done in order to prevent fraud by either the ticket seller and/or the purchaser.

For instance, if a seller arrives at a venue with a ticket, and a purchaser also arrives to the same venue with a replacement ticket for the same seat, the venue controller can be accessed to determine which ticket is valid. The replacement ticket always supersedes the original ticket, provided it is registered in the replacement ticket table 630 of the venue controller 400. If such fraud is attempted by the seller and detected by central controller 200, the central controller can charge the seller's credit card account the seller amount authorized in field 856 of transaction table 580.

As another example, if two people arrive at the venue with the same replacement ticket, the venue controller can be accessed to determine the rightful owner, based on the contents of the new buyer name field 640, of replacement ticket table 630. These measures taken against fraud will assure customers that there will be no problems in using central controller 200 to buy and sell tickets.

Finally, at step 798, central controller 200 receives verification that the original ticket has been received from the seller, and credits the credit card account of the user selling the ticket with the transaction amount 584. Central controller further updates the date tickets received field 588 accordingly. Surrender of the ticket is preferably accomplished by delivery of the ticket to a will call window of the venue, however other surrender arrangements are possible, such as through the postal service or Federal Express. Once the ticket has been surrendered and the transaction is complete, central controller 200 updates status field 557 of the offer table 550 to "completed" for tracking purposes. Upon receipt of the surrendered tickets, central controller 200 credits the account of the user selling the tickets.

Although the preferred method of surrendering the original tickets is using the mail or other delivery mechanism, numerous alternate embodiments are possible. Using one alternate embodiment, ticket redemption could be constructively accomplished at the time an offer to buy is irrevocably accepted. The alternate embodiment employs event tickets that can be physically altered to render them invalid or void. Each ticket includes a unique ticket number that is pre-printed on the face of the ticket, but obscured from view by a scratch-off covering, such as an opaque latex coating. The

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ticket number is unknown to the ticket holder unless the scratch-off covering is removed.

At the time of acceptance, the seller possessing the tickets is instructed to remove the covering over the ticket number on each ticket to be sold. The ticket number is provided to central controller 200 to verify that the ticket seller is, in fact, in possession of valid tickets. The ticket number provided for each ticket involved in the transaction is then electronically voided and replacement ticket number is assigned as previously described.

The act of revealing the ticket number not only serves to verify the ticket seller's possession of the tickets, but also eliminates the need for the seller to surrender the tickets because removal of the scratch-off covering voids the tickets. While this alternate embodiment requires additional structure with respect to the event tickets, it eliminates the need to reserve a portion of the seller's credit line as a penalty for failing to return the unused tickets.

#### Illustrative Example

An illustrative example of the invention will now be described using the data populating various fields of the figures. Record 572 of the offer table 550 is a guaranteed offer to buy as indicated by type field 556 that has been submitted by user 4000 as identified by customer ID field 552. User 4000, as denoted by record 548 in the customer table 530 is Sue Black, residing at 101 Pink Ave in Norwalk, CT. The credit card number submitted to central controller 200 is Discover card number 4444-4444-4444-4444 that expires August 2002 and was issued to Susan Black.

In record 572 of the offer table 550, Sue Black has posted a guaranteed offer to buy two tickets to event ID E001, as denoted by event ID field 553, for \$200.00 per ticket in the first row of the first section of the venue. As denoted by record 514 of event table 500, event E001 is an NHL game, specifically NJ Devils vs. New York Rangers, occurring on 5/6/97 at 7:30 PM at "MSG" as denoted by venue ID field 508. Record 526 of venue table 520 identifies MSG as the Madison Square Garden venue in New York, N.Y.

In addition to this guaranteed purchase offer, Sue Black has also posted a link offer as denoted by linked ID field 568. This linked offer has an ID code of 0333. Record 570 of offer table 550 has the offer ID 0333, and is therefore the offer that is linked to record 572. Record 570 is an offer by Sue Black to purchase four tickets to the NHL game NJ Devils vs. New York Rangers having the same date and time as the offer request of record 572. In record 570, Sue Black indicates that she will pay \$250 each for four tickets in the first row of the first section of the venue. Because offer 570 is linked to offer 572, Sue Black has indicated that she would like one or the other of the two offers.

Field 566 of offer table 550 indicates that \$1,000 has been authorized by Discover for account 4444-4444-4444-4444 for both records 570 and 572, submitted by Sue Black. \$1,000 is the maximum possible amount that Sue Black's offers could cost her if one of them is fulfilled.

For record 572, the transaction ID field 567 has been populated with a transaction ID, indicating that a buyer has accepted Sue Black's guaranteed offer to buy. Status field 557 of record 572 registers that the offer has been fulfilled, and the status record 570 is expired, since it was linked to record 572 in a way indicating that if one was filled, the other should be disregarded.

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Record 595 of transaction table 580 describes the detail of transaction TR001, which is the acceptance of Sue Black's guaranteed offer to buy by seller 2000, as indicated by seller ID field 589.

Record 570 of the customer table 530 indicates that customer having the ID number 2000, as indicated by customer ID field 532, is Jill Janson, residing in 456 Red Drive, Atlanta GA, and having Master Card number 2222-2222-2222-2222 with expiration date 9/99 registered with central controller 200.

Record 595 indicates that Sue Black was charged \$420 on 5/2/97 for her purchase of seats 003 and 004 of row 1, seat 1 of the event tied to the record of her guaranteed purchase offer in offer table 550. Record 595 also indicates that Jill Janson has sold her original ticket numbers 667913 and 667914, stored in the original ticket number field 810, for section 001, row 001, and seat 003 and 004. The seller amount authorized field 585 stores \$400, the amount that central controller 200 has been authorized by Mastercard to debit from account 2222-2222-2222-2222 in the event that Jill Janson does not honor her agreement to sell her tickets. All or a portion of this amount can be credited to Sue Black if there is a problem using her new ticket number for access to the venue event.

The date tickets received field 588 is blank for this record, indicating that central controller 200 has not yet received verification that Jill Janson has surrendered her tickets. Once central controller 200 has received verification that Jill Janson has surrendered her tickets, Jill Janson's credit card account will be credited \$380, the amount stored in transaction amount field 584.

Central controller 200 has issued replacement ticket numbers to Sue Black for both seats. These replacement ticket numbers are stored in field 594. Preferably, Sue Black will print out these replacement ticket numbers and take them with her to the venue to gain access to the event.

Records 622 and 624 of ticket table 610 store information relating to the original tickets issued to Jill Janson. Records 644 and 646 of replacement ticket table 630 store the replacement ticket numbers issued by central controller 200 to Sue Black, which replace the original ticket numbers given to Jill Janson. These records are stored by venue controller 400 to be used in the event of fraud as previously described.

It is important to note that in the embodiment described above, the notification of the parties, both buyer and seller is performed through contacting their respective remote user terminals. This notification can also be performed using conventional technology including but not limited to telephone, facsimile, e-mail and paging.

In addition to the guaranteed offer and acceptance system of the present invention, the present embodiment is also well suited for other aspects of ticket resale. For example, the present embodiment can include a registration process for certain events or tickets. Such a process would enable a prospective ticket buyer to set up a ticket watch which could be implemented by central controller 200. Central controller 200 could periodically poll offers to determine if specific tickets are available. Availability could be transmitted to a user via conventional telephone lines, E-mail, facsimile or pager. A notification preference could be determined by the user during the registration process.



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Another aspect of ticket resale that is well suited to the present embodiment is advertising. Instead of simply allowing users to place, review and accept offers, the system could provide advertising for products related to events and tickets.

Of course, these and many other features and advantages of the present invention are apparent from the detailed specification. Thus, it is intended by the appended claims to cover all such features and advantages of the invention which fall within the true spirit and scope of the present invention.

Furthermore, since numerous modifications and variations will readily occur to those skilled in the art, it is not desired that the present invention be limited to the exact construction and operation illustrated and described herein, and accordingly, all suitable modifications and equivalents which may be resorted to are intended to fall within the scope of the claims.

We claim:

1. A method for electronically completing a transaction between a remote prospective event ticket buyer and a remote potential event ticket seller, comprising:

electronically receiving from said buyer a purchase offer for an event ticket containing at least one condition, an account number from a general purpose financial account, and authorization to charge said general purpose financial account for a purchase meeting said at least one condition;

electronically making available said purchase offer to a plurality of remote potential event ticket sellers;

electronically receiving from at least one of said remote potential event ticket sellers an unconditional acceptance of said purchase offer;

electronically transmitting a replacement ticket number associated with said event ticket to said buyer; and

electronically receiving a second general purpose financial account number from said seller and authorization to charge an account identified by said second general purpose account number; and processing a charge applied to said account.

2. A method for electronically completing a transaction between a remote prospective event ticket buyer and a remote potential event ticket seller, comprising:

electronically receiving from said buyer a purchase offer for an event ticket containing at least one condition, an account number from a general purpose financial account, and authorization to charge said general purpose financial account for a purchase meeting said at least one condition;

electronically making available said purchase offer to a plurality of remote potential event ticket sellers;

electronically receiving from at least one of said remote potential event ticket sellers an unconditional acceptance of said purchase offer;

electronically receiving a signal representing a ticket number associated with said event ticket and processing a payment to said seller; and

electronically transmitting a replacement ticket number associated with said event ticket to said buyer.

3. A method for electronically completing a transaction between a remote prospective event ticket buyer and a remote potential event ticket seller, comprising:

electronically receiving from said buyer a purchase offer for an event ticket containing at least one condition, an

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account number from a general purpose financial account, and authorization to charge said general purpose financial account for a purchase meeting said at least one condition;

electronically making available said purchase offer to a plurality of remote potential event ticket sellers;

electronically receiving from at least one of said remote potential event ticket sellers an unconditional acceptance of said purchase offer;

electronically transmitting a replacement ticket number associated with said event ticket to said buyer; and

electronically storing data representing a cancellation of said event ticket.

4. A method for electronically completing a transaction between a remote prospective event ticket buyer and a remote potential event ticket seller, comprising:

electronically receiving from said buyer a purchase offer for an event ticket containing at least one condition, an account number from a general purpose financial account, and authorization to charge said general purpose financial account for a purchase meeting said at least one condition;

receiving name data representing an identity of said buyer;

storing said name data to associate said identity of said buyer with said event ticket;

electronically making available said purchase offer to a plurality of remote potential event ticket sellers;

electronically receiving from at least one of said remote potential event ticket sellers an unconditional acceptance of said purchase offer; and

electronically transmitting a replacement ticket number associated with said event ticket to said buyer.

5. A method for electronically completing a transaction between a remote prospective event ticket buyer and a remote potential event ticket seller, comprising:

electronically receiving from said buyer a purchase offer for an event ticket containing at least one condition, an account number from a general purpose financial account, and authorization to charge said general purpose financial account for a purchase meeting said at least one condition;

electronically making available said purchase offer to a plurality of remote potential event ticket sellers;

electronically receiving from at least one of said remote potential event ticket sellers an unconditional acceptance of said purchase offer;

electronically transmitting a replacement ticket number associated with said event ticket to said buyer; and transmitting to a venue controller a ticket identifier associated with said event ticket.

6. The method of claim 5, wherein the step of determining said replacement ticket identifier includes the step of receiving said replacement ticket identifier from said venue controller.

7. A method for electronically completing a transaction between a remote prospective event ticket buyer and a remote potential event ticket seller, comprising:

electronically receiving from said buyer a purchase offer for an event ticket containing at least one condition, an account number from a general purpose financial account, and authorization to charge said general purpose financial account for a purchase meeting said at least one condition;

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electronically making available said purchase offer to a plurality of remote potential event ticket sellers;

electronically receiving from at least one of said remote potential event ticket sellers an unconditional acceptance of said purchase offer; and

electronically transmitting a replacement ticket number associated with said event ticket to said buyer, wherein said replacement ticket number includes an original ticket identifier.

8. A computer-readable storage medium encoded with processing instructions for implementing a method for electronically completing a transaction between a remote prospective event ticket buyer and a remote potential event ticket seller, said processing instructions for directing a computer to perform the steps of:

electronically receiving from said buyer a purchase offer for an event ticket containing at least on condition, an account number from a general purpose financial account, and authorization to charge said general purpose financial account for a purchase meeting said at least one condition;

electronically making available said purchase offer to a plurality of remote potential event ticket sellers;

electronically receiving from at least one of said remote potential event ticket sellers an unconditional acceptance of said purchase offer;

electronically transmitting a replacement ticket number associated with said event ticket to said buyer;

electronically receiving a second general purpose financial account number from said seller and authorization to charge an account identified by said second general purpose account number; and

processing a charge applied to said account.

9. A computer-readable storage medium encoded with processing instructions for implementing a method for electronically completing a transaction between a remote prospective event ticket buyer and a remote potential event ticket seller, said processing instructions for directing a computer to perform the steps of:

electronically receiving from said buyer a purchase offer for an event ticket containing at least on condition, an account number from a general purpose financial account, and authorization to charge said general purpose financial account for a purchase meeting said at least one condition;

receiving name data representing an identity of said buyer; storing said name data to associate said identity of said buyer with said event ticket;

electronically making available said purchase offer to a plurality of remote potential event ticket sellers;

electronically receiving from at least one of said remote potential event ticket sellers an unconditional acceptance of said purchase offer; and

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electronically transmitting a replacement ticket number associated with said event ticket to said buyer.

10. A computer-readable storage medium encoded with processing instructions for implementing a method for electronically completing a transaction between a remote prospective event ticket buyer and a remote potential event ticket seller, said processing instructions for directing a computer to perform the steps of:

electronically receiving from said buyer a purchase offer for an event ticket containing at least on condition, an account number from a general purpose financial account, and authorization to charge said general purpose financial account for a purchase meeting said at least one condition;

electronically making available said purchase offer to a plurality of remote potential event ticket sellers;

electronically receiving from at least one of said remote potential event ticket sellers an unconditional acceptance of said purchase offer; and

electronically transmitting a replacement ticket number associated with said event ticket to said buyer; and

transmitting to a venue controller a ticket identifier associated with said event ticket.

11. The article of manufacture of claim 10 wherein the step of determining said replacement ticket identifier includes the step of receiving said replacement ticket identifier from said venue controller.

12. A computer-readable storage medium encoded with processing instructions for implementing a method for electronically completing a transaction between a remote prospective event ticket buyer and a remote potential event ticket seller, said processing instructions for directing a computer to perform the steps of:

electronically receiving from said buyer a purchase offer for an event ticket containing at least on condition, an account number from a general purpose financial account, and authorization to charge said general purpose financial account for a purchase meeting said at least one condition;

electronically making available said purchase offer to a plurality of remote potential event ticket sellers;

electronically receiving from at least one of said remote potential event ticket sellers an unconditional acceptance of said purchase offer; and

electronically transmitting a replacement ticket number associated with said event ticket to said buyer,

wherein said replacement ticket number includes an original ticket identifier.

\* \* \* \* \*



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(12) **United States Patent**  
Jain et al.

(10) Patent No.: **US 6,343,278 B1**  
(45) Date of Patent: **Jan. 29, 2002**

(54) **COMBINED ORDER LIMIT FOR A GROUP OF RELATED TRANSACTIONS IN AN AUTOMATED DEALING SYSTEM**

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(73) Assignee: **EBS Dealing Resources, Inc.**

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/390,621**

(22) Filed: **Sep. 3, 1999**

**Related U.S. Application Data**

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(51) Int. Cl.<sup>7</sup> ..... **G06F 17/60**

(52) U.S. Cl. .... **705/37; 705/36**

(58) Field of Search ..... **705/35, 36, 37**

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(57) **ABSTRACT**

An improved multiple order facility for a computerized trading system in which a first trader submits a plurality of orders for display and acceptance by other traders, including a first subsystem which permits the first trader to simultaneously generate a plurality of orders, and a second subsystem which displays the orders at computer terminals of the other traders to whom the orders were sent. Using the first subsystem, the first trader selects one or more financial instruments associated with a respective one of the orders from a displayed list of related financial instruments, selects a common quantity to be applied to each of the orders, and selects, for each order, a respective price at which the first trader is willing to buy or sell the financial instrument associated with that order. Each of the orders is then sent to a plurality of other trading using the computerized trading system. The second subsystem provides a display of the orders at computer terminals for each of the other traders to whom the orders were sent. Each order display includes the price for the financial instrument associated with the order as selected by the first trader; and an available quantity of the financial instrument associated with the order, the available quantity initially being equal to the common quantity set by the first trader and being reduced whenever a deal is made covering only a part of any of the plurality of orders by any of the other traders.

**26 Claims, 4 Drawing Sheets**

Figure 1 is a screenshot of a trading system interface. The interface is divided into several sections. At the top, there is a header bar with buttons for 'Buy', 'Bid', 'Offer', 'Sell', 'Select All', 'Clear All', and 'Off All'. Below this, there is a section for 'USD-Sep98' showing a list of orders with columns for time, price, and quantity. The orders are listed in a table format. Below the 'USD-Sep98' section, there is a section for 'USD IMM' showing a list of orders with columns for time, price, and quantity. The orders are listed in a table format. Below the 'USD IMM' section, there is a section for 'EBS & TFA' showing a list of orders with columns for time, price, and quantity. The orders are listed in a table format. Below the 'EBS & TFA' section, there is a section for 'TFA Messages' showing a list of messages with columns for time, price, and quantity. The messages are listed in a table format. At the bottom of the interface, there is a section for 'Order Limit' showing a list of orders with columns for time, price, and quantity. The orders are listed in a table format.



**TDP**

☐ BBS ☐ ABNL-FRA

**USD - Sep98**

14-Sep-98 0 of 70 85.50 5. 89.00 85.50 50 of 50 09:37 5.8550 G

16-Sep-98 85.50 89.50 09:37 5.8550 G

16-Dec-98 off 50+ 70 10 50+ clear 09:34 5.8950 P

**TC**

**USD IMM**

Jun98 5. 40 78.25 82.25 90

Sep98 5. 70 85.50 89.00 10

Dec98 5. 10 97.75 00.75 70

Mar99 5. 90 97.75 00.75 50

Jun99 6. 140 00.25

Sep99 6. 20 04.00 08.25 70

Dec99 6. 30 14.50 18.25 80

Mar00 6. 80 07.25 10.75 60

**Order Limit**

200 200

**TL**

**EBS & TFA**

**EBS Deals**

09:37 XEU	Jun99	4.3600 G
09:37 JPY	Sep98	0.6625 G
09:37 USD	Sep99	6.0400 P
09:37 GBP	Sep99	6.4800 G
09:37 JPY	Dec99	1.0700 G
09:37 GBP	Mar99	6.8500 G
09:37 USD	Jun99	6.0075 G
09:37 JPY	Dec99	1.0700 P
09:37 GBP	Sep98	7.2575 G
09:37 XEU	Sep98	3.8750 G
09:37 USD	Sep98	5.8550 G
09:37 XEU	Sep98	3.8700 G
09:37 USD	Jun99	6.0025 G
09:37 GBP	Sep99	6.4800 P
09:37 JPY	Dec98	0.7025 G

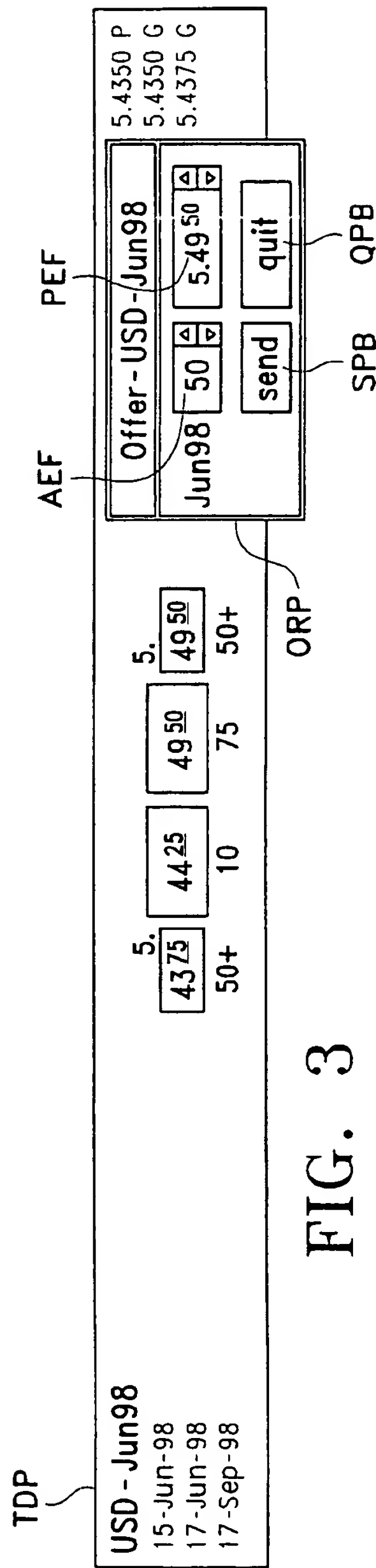
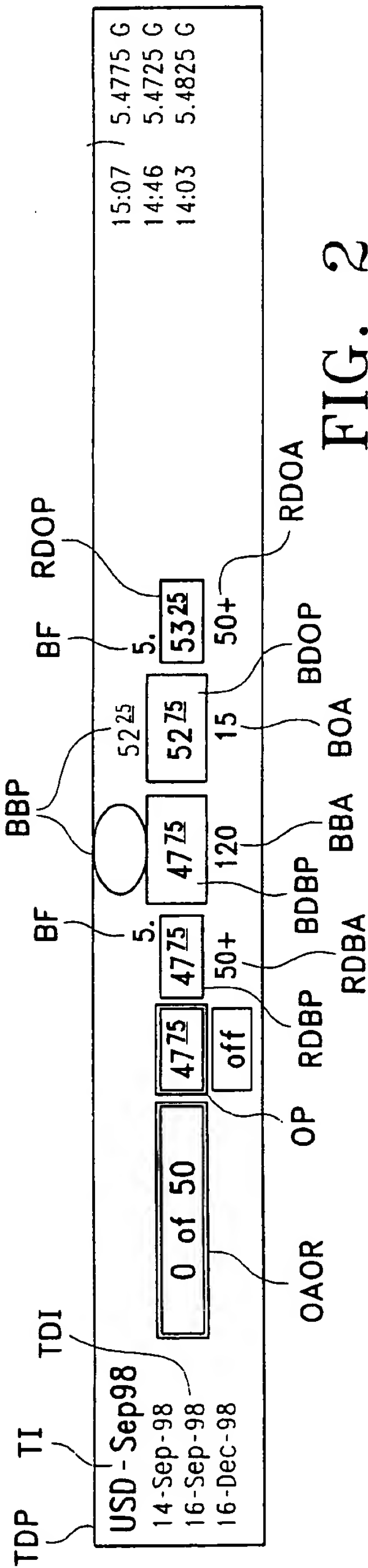
**TFA Messages**

**TB**

**Trader Deals**

09:32 B	10	5.7800	CITN	USD	Jun98
09:33 S	50	3.7275	UBSN	DBM	Jun98
09:33 B	50	6.0075	UBSN	USD	Dec98
09:33 B	30	5.8175	UBSN	USD	Jun98
09:33 B	70	5.8900	UBSN	USD	Sep98
09:33 B	15	6.0100	UBSN	USD	Mar99
09:33 B	20	5.8175	UBSN	USD	Jun98
09:34 B	50	5.8950	CITN	USD	Sep98
09:34 B	50	5.8250	CITN	USD	Jun98
09:35 B	40	6.1775	UBSN	USD	Dec99
09:35 B	10	6.1775	UBSN	USD	Dec99
09:36 S	50	6.1425	UBSN	USD	Dec99
09:36 S	20	6.1425	UBSN	USD	Dec99
09:36 S	20	5.7800	UBSN	USD	Jun98
09:36 S	30	5.7800	CITN	USD	Jun98
09:37 S	15	5.8550	CITN	USD	Sep98
09:37 S	35	5.8550	UBSN	USD	Sep98

FIG. 1



USD IMM

Jun98

80

5.  
44 50

49 00

10

✓

Sep98

80

5.  
48 25

52 25

20

✓

Dec98

30

5.  
69 25

73 50

60

✓

Mar99

20

5.  
56 25

55 00

10

✓

Jun99

10

5.  
46 50

50 75

60

Sep99

70

5.  
63 00

67 75

90

Dec99

20

5.  
44 75

49 75

60

Mar00

50

5.  
26 25

30 75

60

Order Limit

0 of 200

0

200

200

Bid-Strip: (4) USD

Jun98

200

5. 4 00

Sep98

200

5. 48 25

Dec98

200

5. 69 25

Mar99

200

5. 56 25

Δ

▽

Δ

▽

send

quit

11:41

USD

Mar99

5.55

50 G

11:42

XEU

Sep98

4.47

00 G

11:45

DEM

Dec99

4.44

75 G

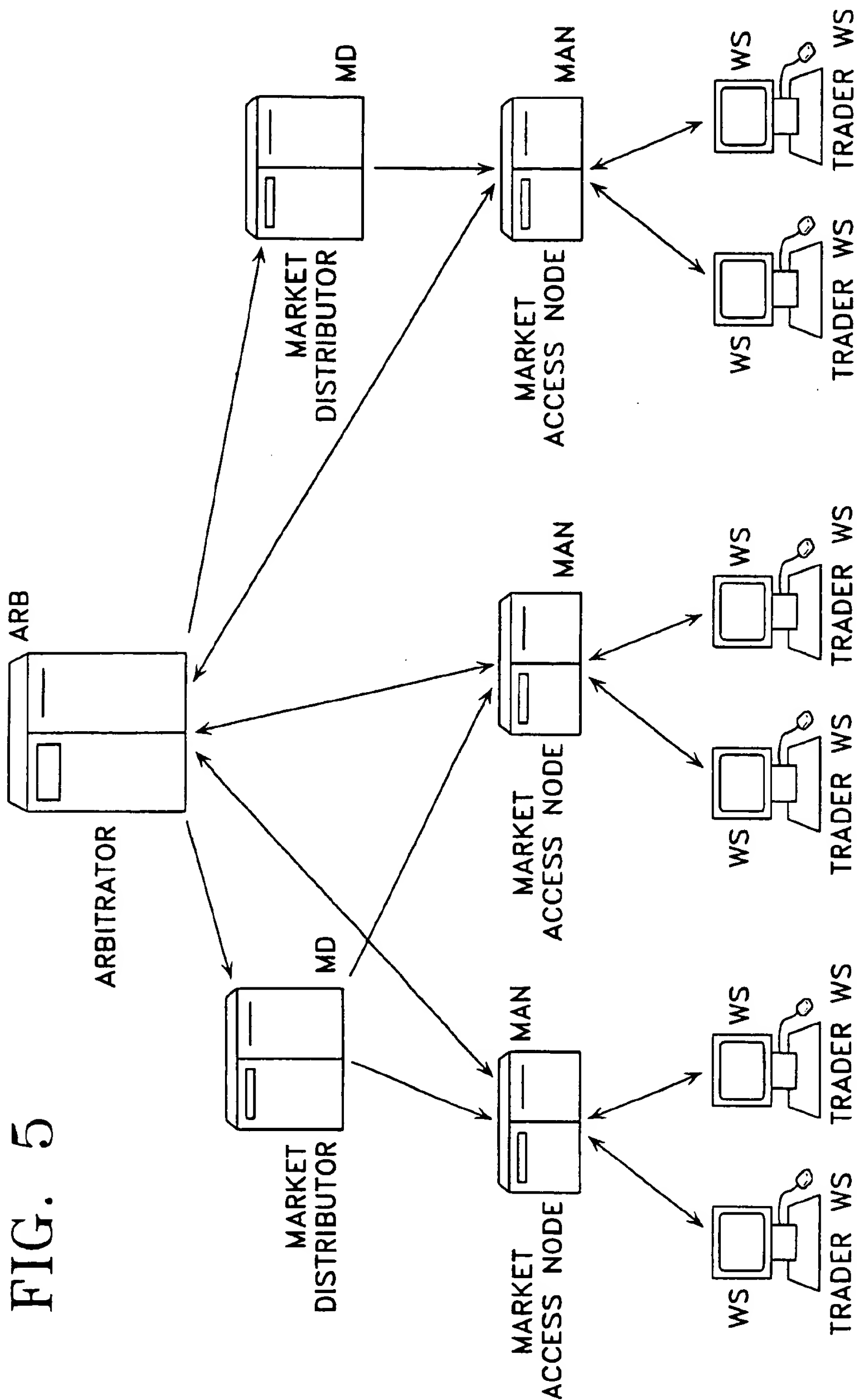
TFA Messages

Δ

▽

FIG. 4

02/24/2003, EAST Version: 1.03.0002



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# COMBINED ORDER LIMIT FOR A GROUP OF RELATED TRANSACTIONS IN AN AUTOMATED DEALING SYSTEM

## CROSS REFERENCE TO RELATED APPLICATION

This application is based on and claims the benefit under 35 U.S.C. 119 of U.S. Provisional US Application No. 60/099,243 filed on Sep. 4, 1998, which is hereby incorporated by reference in its entirety.

## TECHNICAL FIELD

The present invention relates generally to an electronic brokerage system having a communication network connecting traders dealing in financial instruments, and more particularly to a computerized system for coordinated trading of multiple instruments such as different tenors of forward rate agreements for the same currency.

Commonly assigned U.S. Pat. No. 5,375,055 (Togher et al) discloses an automated matching system for anonymous trading of foreign currencies in which traders may enter bids and offers through trader workstations into a distributed matching system. Credit limits, set by the potential parties to a transaction, are stored at Market Access Nodes to which the workstations are connected. The credit limits are analyzed as part of the deal completion procedure, and deals which would exceed the credit limits are inhibited. The Market Access Nodes are linked to one or more Arbitrators and to one or more Market Distributors. The Market Distributors' function is to distribute prices of open bids and offers using a Pre-Authorization Matrix derived from credit limits stored at the Market Access Nodes. The Pre-Authorization Matrix is used to inhibit trades between incompatible counterparties and also to screen bids/offers prior to display so that bids/offers shown to a trader are "dealable", that is, there is credit available to the trader to at least partially deal the displayed quote. An improved version of this system is also known and implemented as the EBS system for anonymous dealing of spot foreign exchange transactions.

The known EBS system also includes a provision for establishing minimum and maximum amounts for any single trade by a particular trader and for establishing a default price (based on current market conditions) and amount (based on trader preference) for a single proposed trade which the trader can adjust upwards or downwards before submitting to the market for possible acceptance of other traders with whom he has bidirectional credit.

We have appreciated, however, that while many aspects of such a spot trading system are also applicable to the trading of derivatives, the derivatives market is more segmented in terms of the particular "tenors" being traded for a particular currency or other commodity, and as a result, a trader will frequently want to enter alternative proposals for a particular commodity, differing only by settlement date, gap, or other settlement terms. However, because of the fast response times inherent in an automated trading system, it is not feasible for a trader to enter the alternate proposals into the known trading system as separate orders without risking more than one such order offer being accepted before the remaining orders can be manually canceled. The situation is further exacerbated if only part of an outstanding order is accepted and/or if different orders have different associated risks or limits, so that more is required than simply canceling one order if an alternate related order is accepted.

## SUMMARY OF THE INVENTION

Accordingly, there is provided an improved computerized trading system for trading financial instruments or other

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commodities between traders at trader terminals, wherein the trading system facilitates manual entry and possible revision of a group of related orders for derivatives based on a common underlying currency or other commodity. In particular, the group of orders may optionally be made be subject to a common order limit whereby all the related orders are automatically reduced whenever one such order is accepted. This gives a degree of control and flexibility not provided in the prior art noted above, providing greater market liquidity and flexibility of terms to potential market participants without appreciably increasing the potential exposure assumed by the market maker responsible for the multiple orders.

In one embodiment, the group of related orders are selected from a respective "sheet" of different "tenors" for forward rate agreements in the same side of the market and involving the same currency, the same gap, and the same reference rate. However, without departing from the spirit of the present invention, several such groups may combined under a single order limit, and/or the same or a combination of such groups may be subject to multiple, possibly overlapping credit limits.

In another embodiment, the sizes of the different tenors subject to a combined order limit are normalized in accordance with defined differences between the different tenors of the same group, such as gap or minimum deal size (notional amount), conventionally associated with each individual tenor.

Preferably, the available amount associated with a particular order limit is initially set above a predetermined minimum notional amount applicable to all the selected tenors in the associated group, regardless of exposure, and is automatically adjusted as the individual orders for those particular tenors are matched, completed, or re-entered. As each such adjustment to the available amount is made, the notional amounts for all of the other individual open orders subject to that same order limit are also compared with the adjusted available amount, possibly taking into account not only the actual notional amounts involved but also the relative exposure associated with each tenor and/or other market conventions used to "normalize" the minimum notional amounts frequently associated with different tenors, such as a "3-month equivalent".

It should be noted that the embodiment described later is one in which the functions of the network are distributed throughout a variety of components. This is considered to be the most effective manner of implementing the system. However, it will be appreciated that it would be possible to incorporate this functionality into a system with a single location for all these functions, or into another system architecture having some aspects of a fully distributed system and some aspects of a fully centralized system.

## BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the invention will be described by way of example only, and with reference to the accompanying figures in which:

FIG. 1 depicts an overview of the trader's trading screen;

FIG. 2 shows a Tenor Detail Panel for the trader's screen shown in FIG. 1;

FIG. 3 shows Order Request Panel for the trader's screen shown in FIG. 1;

FIG. 4 shows a Multiple Order Request Panel for the trader's screen shown in FIG. 1;

FIG. 5 shows an exemplary system architecture based on an existing EBS system.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The system of the present invention is applicable to trading various types of derivatives contracts but is described in relation to Forward Rate Agreements (FRA) for which the described embodiment has been especially adapted.

#### Overview of FRA's

A Forward Rate Agreement (FRA) is a contract between two parties to lock in a forward interest rate, for a period, starting at a specific date in the future. Each FRA contract can be categorized as a spot FRA, an IMM FRA, or a broken date FRA. All these may be traded on the system of the present embodiment. IMM is the abbreviation which has become customary to refer to an instrument traded on one of the International Monetary Market dates. In brief, IMM FRAs are traded for the four International Monetary Market (IMM) dates. Spot FRAs are traded for dates associated with today's spot date. A broken date FRA is a spot FRA which is traded for a different spot date than today's spot date.

A FRA trading screen of a system embodying the invention is shown in FIG. 1. The FRA trading workstation presents a set of FRA contracts that may be traded in an electronically brokered format. Each type of contract is known as a tenor. Price information for a particular tenor is displayed on a tenor line. For each tenor line, the dealing system presents the best credit-screened bid and offer prices of all active quotes. Upon selection of the tenor line, the workstation presents a detailed view of the associated tenor showing contract dates and additional market view information.

A trader may select a tenor line and then submit one of four order types (Bid, Offer, Buy, or Sell). Each type of order requires the trader to specify an interest rate notional amount for a particular tenor. Once submitted, new orders are matched with outstanding orders in price/time priority. Compatible orders are matched resulting in the execution of deals. In order to encourage market making a trader can submit and adjust bids and offers for several tenors at a time.

For non-standard FRAs, a price inquiry function allows the trader to issue a system-wide broadcast to request a price

For example, a 6x9 FRA is a contract covering a period that begins 6 months from now and ends 9 months from now. The term or gap of such a contract is 3 months. The two counterparties, one buyer and one seller, settle by cash payment at the start of the contract (in this case 6 months from now).

The buyer of a FRA will be compensated if future interest rates rise. The seller of an FRA will be compensated if future interest rates fall.

Settlement is based on the difference between the actual interest rate prevailing on the fixing date and the rate specified in the contract, for a specific notional amount stated in the contract. Settlement takes place at the beginning of the term.

As an example, consider a USD 6x9 FRA trade for \$100 million (US) at an agreed upon rate of 5.5675 executed on Sept. 9, 1997. The deal has the following characteristics:

Trade Date: Sep. 9, 1997

Spot Date: Sep. 11, 1997

Fixing Date: Mar. 9, 1998

Settlement Date: Mar. 11, 1998

Maturity Date: Jun. 11, 1998

Contract Rate: 5.5675

Notional Amount: 100 million (US\$)

Reference Rate: LIBOR

The period of this deal begins on Mar. 11, 1998 (the settlement date) and ends on Jun. 11, 1998 (the maturity date). On March 9<sup>th</sup>, sometime after 11:30 AM London time, the back office personnel at each bank will look on the appropriate Reuters page to read the 3-month LIBOR rate posted for March 9<sup>th</sup>. If, for example, this rate is 5.5800 (the "Fixing Rate") then between the Trade Date and the Settlement Date, the interest rate has risen 0.0125 percent or 1¼ basis points. Therefore, a settlement amount must be calculated based on this Fixing Rate of 5.58%. The settlement amount is the amount on the check paid by the seller to the buyer. The settlement amount is calculated using the following formula:

$$\frac{\left( \frac{(\text{Fixing Rate}) - (\text{Contract Rate})}{100} \right) \cdot \left( \frac{\text{Days in Period}}{360} \right) \cdot (\text{Notional Amount})}{1 + \left( \frac{\text{Fixing Rate}}{100} \right) \cdot \left( \frac{\text{Days in Period}}{360} \right)}$$

for a broken date FRA. A trader may respond to a price inquiry by selecting the entry in the bulletin board.

The trading screen shown in FIG. 1 provides traders with the facility to enter bids, offers, buy or sell orders by selecting buttons on a toolbar at the top of the screen. The best bid/offer prices are displayed for tenors of various lines in one window and deals done by the trader and on the system as a whole are displayed in other windows. The display is better understood with reference to an example of a FRA deal.

If a single tenor is selected (for example, by means of a mouse or keypad at the trader's workstation), then the details of the FRA tenor line are presented in the top section of the screen. The detail area shows the best dealable, EBS best, and best regular prices for the selected tenor. The fixing date, settlement date, and maturity date of the active tenor are shown as well.

As explained, a Forward Rate Agreement (FRA) is a contract between two parties to lock in a forward interest rate, for a period, starting at a specific date in the future.

$$\frac{\left( \frac{(5.58) - (5.5675)}{100} \right) \cdot \left( \frac{92}{360} \right) \cdot (100,000,000)}{1 + \left( \frac{5.58}{100} \right) \cdot \left( \frac{92}{360} \right)}$$

which reduces to:

$$\frac{3194.44}{1.01426} = 3149.53$$

with the denominator (1.01426) merely being a "present value" discount which takes into account the fact that although the quoted rate assumes payment of principal and interest at the end of the Period in question, settlement actually occurs at the beginning. Note that if interest rates had fallen, then the buyer of the FRA must pay the seller the settlement amount.



FRAs serve as both a hedging and a speculative instrument. A bank may use an FRA to hedge against future inflows and outflows of cash on its balance sheet, or a bank may use an FRA to speculate in the future movement of interest rates. By definition, an FRA trades over-the-counter. The resultant contract is between two parties and is therefore dissimilar to a futures contract which is traded via an exchange.

The foregoing embodiment is described in relation to IMM FRAs; that is FRAs which are based on the International Monetary Market dates. However, many aspects of the present invention are also applicable to other types of FRAs such as Spot FRAs and Broken Date FRAs.

FRAs are distinguished by the dates of the contract, the reference rate, and the contract currency. Each type of FRA contract is called a tenor. Some example tenors are listed below:

Examples of FRA Tenors:		
Cash 3 month	Cash 6 month	Cash 12 month
USD 1 x 4	DEM 1 x 7	USD 1 x 13
USD 3 x 6	USD 2 x 8	DEM 2 x 14
JPY 6 x 9	JPY 6 x 12	USD 12 x 24
IMM FRAs with		
IMM FRAs	a 6 month gap	Broken Date FRAs
USD Sep 97	USD Jun 97-6	USD 3 x 6 (12)
USD Dec 97	USD Sep 98-6	DEM 2 x 14 (10)
JPY Mar 98	JPY Sep 98-6	USD 0 x 3 (3)

The "Reference Rate" specifies how the interest rate is determined to which the contract interest rate will be fixed in order to determine the settlement amount. A common Reference Rate is LIBOR that is an acronym for London Interbank Offered Rate. Other examples include PIBOR (Paris), TIBOR (Tokyo), PRIBOR (Prague), and DIBOR (Dublin). The settlement calculation will use the interest rate associated with the turn of the contract. For example, a USD 1x4 FRA contract will have a three month LIBOR fixing. The daily set of LIBOR rates is the result of a survey of London banks and is made available on a Reuters page and later published in financial newspapers. The following list shows Reference Rates for common FRA tenors in various contract currencies.

Currency	Reference Rate
USD	LIBOR
YEN	LIBOR
CHF	LIBOR
GBP	LIBOR
DEM	LIBOR/FIBOR
AUD	LIBOR
CAD	LIBOR/CDOR
FRF	LIBOR/PIBOR
XEU	LIBOR
ITL	LIBOR
ESP	LIBOR
PTE	LIBOR/LISFRA
NLG	AIBOR
SEK	STIBOR
DKK	CIBOR
NOK	NIBOR

-continued

Currency	Reference Rate
FIM	HELIBOR
BEF	BIBOR
NZD	KIBOR

An instrument refers to the class of trades or potential trades which would be settled under equivalent FRA terms. (This does not include FRABBA/ISDA terms) This classification can be uniquely defined by the following criteria:

Contract Currency

Reference Rate

Fixing Date

Maturity Date

Exemplary Trader's Workstation

Turning again to FIG. 1, the screen can now be better understood. The Tenor Detail Panel (TDP) provides a detailed view of tenor line information and transaction activity for a single tenor. The Tab Controls (TC)(only one is shown in FIG. 1) allow a user to select one of several user-defined tab sheets. The user may designate the tab sheet properties and components. Although for the sake of clarity only a single tab sheet is shown, in a typical usage environment, a trader may have multiple tabs sheets, each associated with a different combination of currency and reference rate. It would also be possible to include more than one combination of currency and Reference Rate on the same sheet, thereby facilitating the creation of a single credit limit for two or more instruments which are normally not considered related. Each individual Tenor Line (TL) shows a tenor indicator (e.g., September 1998 IMM FRA for USD), best bid and offer prices, best amount available for bid and offer and a big figure.

A number of tenor lines (more than fifty) may be visible on the screen concurrently. There may be additional tenor lines that are not visible on the screen due to space constraints (identified with an appropriate Tab (T)), but can be easily brought into view. The screen also allows the trader to elect to show fewer tenors (as few as eight) depending upon the trader's preference.

The Tenor Detail Panel (TDP) is shown in FIG. 2 and shows a selected Tenor Line in more detail. It includes:

Tenor Identification (TI) (currency and description)

Tenor Date Information (TDI) (Fixing Date, Settlement Date, and Maturity Date)

Regular Dealable Bid (RDB) and Offer (RDO) Prices for "regular" amounts satisfying credit screening (A "regular" amount is an amount at least equal to a system default value representative of a typical trade in a particular currency, and may for example be 50 M pounds)

Best Dealable Bid (BDB) and Offer (BDO) Prices (the best price available after credit screening for any amount) along with the total quantity ("Best Bid and Offer Amounts") available at those prices. EBS Best Bid (BBP) and Offer (BO) Prices (the best price available on the whole system regardless of credit (even this may not be available to the trader) if this different from the corresponding Best Dealable Prices. Note that much of this information is also shown in each Tenor Line of each Tab Sheet (TS) (FIG. 1).

To the left of FIG. 2 is a bid/buy Order Status (OAOR) indicator showing the amount requested (50) and obtained (0) for an open order. If a Offer/Sell order was pending, its status would be displayed on the right.

Note that the bid (buy) prices are on the left hand side of the Tenor Detail Panel (TDP), and the offer (sell) prices are on the right hand side, and that all displayed prices are arranged in ascending order from left to right. The EBS Best Bid Price (BBP) (if shown) will always be better than the Best Dealable Bid (BDB) Price. This is because the credit granting entity for this trading floor may not have extended sufficient credit to the counterparty offering the Best Bid Price (or vice versa). Similarly, the Best Dealable Bid Price

will prevent the user from proceeding in case there a serious error condition is encountered, otherwise a warning is displayed. The workstation will display the message as set forth in Table 1 (below) and will highlight the data field in red color. Each order is validated by the system prior to submission to the market, and the trader is notified if any of the potential error conditions set forth in Table 1 are present:

TABLE 1

Deal Verification					
Buy/Sell Warning Name:	Priority:	Warning Type:	Bid/Offer Warning Name:	Priority:	Warning Type:
Price Can't Be Blank	1	Error	Price Can't Be Blank	1	Error
Trade Size Can't Be Blank	2	Error	Trade Size Can't Be Blank	2	Error
Trade Size Can't Be Zero	3	Error	Trade Size Can't Be Zero	3	Error
Price Can't Be Zero	4	Error	Price Can't Be Zero	4	Error
Price Not A Multiple of X (Where X = Price Increment)	5	Error	Price Not A Multiple of X (Where X = Price Increment)	5	Error
Trade Size Invalid	8	Error	Price matches your own order	6	Error
Trade Size > Max Trade Size	9	Error	Trade Size Invalid	7	Error
Check Fixing Date	10	Warning	Trade Size > Max Trade Size	8	Error
Large Difference	11	Warning	Check Fixing Date	9	Warning
Wide Spread	12	Warning	Large Difference	10	Warning
Check Rate	13	Warning	Wide Spread	11	Warning
Buy Up To?	14	Warning	Check Rate	12	Warning
Sell Down To?	15	Warning	Big Figure Adjusted	13	Warning
Check Price	16	Warning			
Big Figure Adjusted	17	Warning			

will always be at least as good as the Regular Dealable Bid (RDB) Price. In the particular example shown in FIG. 2, the Best Dealable Bid Amount is 120 which is larger than the "Regular" amount of 50, and consequently the same price (5.4775) is shown as the Regular Dealable Bid (RDB) Price and the Best Dealable Bid (BDB) Price.

FIG. 3 shows the Offer Order Request Panel (ORP) which appears on the right side of the Tenor Detail Panel (TDP) when a particular Tenor has been selected and either the Offer Key (OK) or Sell (SK) Key (FIG. 1) has been activated. (A similar Bid Order Request Panel (not shown) appears on the left side of the Tenor Detail Panel when a particular Tenor has been selected and either the Bid or Buy key has been activated.) The Order Request Panel (ORP) includes an Amount Entry Field (AEF) and a Price Entry Field (PEF), both of which include Up (USB) and Down Spin Buttons (DSB) for adjusting the respect entries up or down, as well as a Send Pushbutton (SPB) for submitting the order (assuming appropriate validation checks are positive) and a Quit Pushbutton (QPB) which dismisses the Order Request Panel (ORP) without any action being taken. As previously indicated with respect to FIGS. 1 and 2, once a valid order has been submitted, its status is displayed on both the Tenor Detail Panel (TDP, FIG. 3) and in the corresponding Tenor Line (TL, FIG. 2), with the latter showing only the Amount Remaining (AR) in the outstanding order (i.e., the difference between the Amount Requested and the Amount Obtained shown in the Tenor Detail Panel).

#### Validation

The workstation will guard against user-input errors during order submission by providing a set of functions that validate against possible key-input errors. These validation functions may have the effect of preventing the user from entering an erroneous keystroke, preventing the user from submitting an order, or providing a warning to the user that an incorrect value may have been entered. The workstation

An exemplary set of applicable rules follows:

1. The workstation will not allow a trader to submit more than one order on the same side of the market for a single tenor and will not allow submission of a single order for two or more tenors.
2. A trader is allowed to cancel his outstanding order at anytime.
3. The Buy and Offer orders are initiated at the Best Dealable Offer Price, unless the trader deliberately initiates a Buy at the Best Regular Offer price by clicking the Best Regular Offer price with the mouse or by pressing the buy reg key on the keypad.
4. The Sell and Bid orders are initiated at the Best Dealable Bid Price, unless the trader deliberately initiates a Sell at the Best Regular Bid price by clicking the Best Regular Bid price with the mouse or by pressing the sell reg key on the keypad.
5. The workstation will not allow a bid/buy and offer/sell order to be submitted at the same time as it will not allow bid/buy and offer/sell panels to be open concurrently.

#### Submitting Multiple Orders

Additionally, as shown in FIGS. 1 and 4, the trading workstation preferably provides many features for managing multiple orders as a group, whereby orders of similar type may be submitted for several tenors at a time. The user is able to select multiple tenors ("strip" or "group") using a mouse, keypad, or keyboard and then submit an order for all of the selected tenors with a valid price in one operation. If a single tenor holds Active Trading Focus (ATF) as shown in FIG. 1, the user is also able to click on a designated Select All (SA) button (FIG. 1) typically using a mouse or stylus (not shown) to select all (typically eight) tenors on the same Sheet (TS) and is able to submit an order for all of these tenors in one operation (the strip is highlighted and each

tenor will contain a Selection Indicator e.g., a check mark). The workstation will send a separate order (Bid or Offer "quote" or Buy or Sell "hit") message to the banknode for each of the tenors selected. As in the case with submitting a single order, the workstation will present the notional amount for all of the orders such that the fields are editable using a mouse, keypad, or keyboard.

After a group of orders has been selected, they may be interrupted (Tool Bar of FIG. 1), or modified and re-submitted as a group (using the Multiple-Order Request Panel (MORP) of FIG. 4). In this way, the trader is able to adjust a strip of outstanding orders as easily as adjusting a single order.

In case of submission of multiple orders, the workstation will validate each order (as described above) and will highlight the order(s) that will have either an error or a warning condition (as described in the following sections). The workstation will prevent the submission of multiple orders as long as an error is encountered on a single order.

#### Multiple Order Limit

In accordance with an important aspect of the present invention, an optional Order Limit may be applied to a group of Multiple Orders involving different Tenors for the same Currency, with a separate Order Limit Notional Amount (OLNA) being established for Bids and Offers.

A trader may designate a single amount that functions as a single limit amount for multiple orders for same currency. Typically, for each combination of currency (e.g., US Dollars) and reference rate (e.g. LIBOR), there is one Order Limit Amount (OLNA) for bids and buys, and another Order Limit Notional Amount (OLNA) for offers and sells.

For a set of orders subject to an Order Limit any deal completed for one order under the Order Limit will reduce the size (that is, will reduce the notional amount) for all the orders by the deal amount. The reduced Order Notional Limit Amount will then become the available notional amount for every order submitted under the Order Limit.

When the Order Limit Notional Amount (OLNA) falls below a trader or system defined Minimum Notional Amount (MNA) parameter, all orders subject to this Order Limit are removed by the dealing system.

Both the Tenor Line (TL) and the Tenor Detail Panel (TP) of the workstation associated with the trader who has submitted an order to the market will display an Order Limit Enabled Indicator (OLEI) if an outstanding order from that trader is subject to an Order Limit imposed by that trader. The Tenor Line (TL) displays the Order Limit icon as an indicator and the amount of the outstanding order is initially set to the remaining Order Limit Amount.

The Order Limit (also called safety net) panel is displayed at the bottom of each sheet for each currency (FIG. 4). The workstation will pre-fill the Order Limit Notional Amount with the default notional amount of the first tenor on that currency sheet (e.g., for the June 1998 USD IMM tenor), which then becomes the Order Size for each of the selected tenors once that particular Order Limit has been enabled. However, in an alternate embodiment (not shown), the Order Limit may be normalized to better take into account market recognized differences between tenors in the same group (for example, to take into account different gaps, using a three month equivalent notional amount). In that case the system generated Order Size may be greater than the normalized Order Limit for those tenors having a gap less than 3 months, and may be less than the normalized Order Limit for those tenors having a gap greater than 3 months.

Once the Multiple Order Panel (MORP) has been populated with the default values for the Order Limit Notional

Amount (OLNA) and the corresponding Order Size (OS) for each selected tenor (e.g., in FIG. 4 the order size 200 (million) has been entered for each tenor of the four selected), it is advantageous for the trader to be able to adjust those default values, preferably by using a group Spin Button (SB) to adjust the Order Limit Amount and all the affected Order Sizes simultaneously, providing the trader is not attempting to define an illegal Order Limit Notional Amount for one of the selected tenors on his Multiple Order Panel (MORP) (for example, an amount that is not a multiple of the Notional Amount Increment or that is less than the Minimum Notional Amount for that currency).

Once all the validations have taken place and before the individual orders are submitted to the market, the workstation creates an Order Limit object and assigns a unique safety net ID to it. It will then send a message to the network node(s) responsible for enforcing the Order Limit Amount (typically the Arbitrator (ARB) bank's Market Access Node (FIG. 5, MAN) which cooperate to perform a initial matching process and two stage commit process with the counterparty's bank on each pending deal identified in the matching process before the deal is considered complete, as discussed in more detail hereinafter under the heading "Overview of Deal Matching Process."

The Safety Net ID may consist of the following fields:

1. Floor key - floor key of the banknode
2. Session Number - session number of the trader session sent by the banknode
3. Transaction Number - unique number to be assigned by the workstation
4. Currency Key - identification of the currency involved

Each safety net context will consist of four amounts:

**Safety Net Amount** The original or total amount of the safety net. This value is set by the workstation and sent to the arbitrator.

**Dealt Amount** The total amount of all completed deals made on quotes that are associated with the safety net.

**Pending Amount** The total amount of all pending deals associated with the safety net.

**Available Amount** The Safety Net Amount minus the Dealt Amount and Pending Amount.

A similar process may be performed at each involved Market Access Node (MAN) using the Order Limit Available and amount to verify that no active Order Limit Amount would otherwise be exceeded.

#### Addition of Order to Order Limit

A trader is allowed to submit a new order under an existing Order Limit only if the available amount in the Order Limit is more than the minimum notional amount. The workstation pre-populates the amount field in the order entry panel with the available Order Limit Amount if a trader decides to subject his order to the Order Limit. The amount field is dynamically updated whenever a message is received which reduces the available amount of the Order Limit. The trader is not allowed to change the amount of his order while subject to the Order Limit.

The workstation validates the Order Limit Notional Amount (OLNA) with the Maximum Trade Size parameter set for that tenor. Similarly, if a trader decides to submit multiple orders under the Order Limit, then each of the orders is individually validated, as described above. All the orders failing the aforementioned validation is displayed in red and an error message "Trade Size>Max Trade Size" (not shown) is displayed at the bottom of the Order Panel (OP) just above the spin buttons (SB).

Once a trader presses the Send Key, the workstation will fill the safety net ID field in the message with the safety net

ID that had been previously assigned to that Order Limit and will send the message to the banknode. Both the Tenor Line (TL) and the Tenor Detail Panel (TDP) of the submitting trader will show the Order Limit Indicator (OLI).

The added order will not 'jump the queue' and in terms of the price/time continuum is placed in the queue on its own merit. There is no impact on the other orders or tenors under the Order Limit. However, orders already in the market cannot be made subject to a Order Limit without first canceling the original order, for example, by hitting one of the order keys (Buy/Bid/Sell/Offer) to thereby cancel the original order.

#### Removal of Order from Order Limit

A trader is allowed to remove a current order from an existing Order Limit. The workstation will cancel the order and will send an Interrupt message to the banknode. There is no impact on the other orders under the Order Limit.

If some amount had already been taken from the order prior to it being removed, the Order Limit Amount has already been adjusted and would not change further as a result of the removal. The Order Limit Amount on the remaining orders subject to the same Order Limit would remain what it was immediately before that order was removed including any prior reduction in the original Order Limit Amount.

Although the described embodiment does not include a Cancel Order Limit button which would automatically cancel all orders under the Order Limit, a trader could highlight each tenor subject to the Order Limit and hit one of the order keys (Buy/Bid/Sell/Offer) and at this point, any outstanding Orders for the selected tenors would be canceled, whether or not they were subject to any Order Limit. A trader is not allowed to increase or decrease the amount of the Order Limit while orders are in the market subject to that Order Limit.

#### Display of Order Amounts

There is no requirement for any special handling of amounts of orders subject to the Order Limit different from other orders, although in an alternate embodiment (not shown), all involved traders (or at least those traders having bilateral credit with the trader submitting an order that is part of the displayed Available Amount (AA) may be given a visual indication that the displayed amounts are subject to a common Order Limit, and thus the amount actually available in the market may be only a fraction of what is shown on his display. The amount displayed within each Tenor Line with an order subject to the Order Limit will typically correspond to the amount remaining in the Order Limit and available to the market (with the caveat that two tenors may be subject to a common Order Limit and thus the full available amount of the other tenor may not be available after the first is taken). The amount display in the Tenor Detail Panel for an order subject to the Order Limit typically will display in addition the original amount made available and possibly also the aforementioned indication of whether some or all of that amount is subject to a common Order Limit with one or more other tenors.

#### Termination of Order Limit

In order to prevent using an order limit to take unfair advantage of other traders by securing a favored position in the time/price queue maintained by the matching engine without a concomitant commitment to honor the order as originally submitted, it is desirable that the trader can neither cancel nor increase a particular Order Limit while there are any outstanding orders remaining in the market that were originally entered under that Order Limit. However, once all of the submitted orders have been dealt and/or canceled, so

that the trader's order no longer has a preferential position in any applicable queue, the trader may cancel that Order Limit prior to submitting any new orders, and the workstation will send a message to the banknode to delete the Order Limit and will remove the Order Limit object.

The banknode (MAN) or arbitrator (ARB) may cancel the Order Limit if any of the validations fail at their end. In that case, the banknode will automatically cancel all the orders under the Order Limit when it cancels the Order Limit, whereupon it will send a cancel message to the workstation. The workstation, upon receiving such a cancel message will check for any outstanding orders. If there are any outstanding orders subject to the Order Limit, then it will log an error. It will then cancel all the outstanding orders subject to the Order Limit and will remove the order limit object.

Once the Order Limit Amount is exhausted or is below the minimum notional amount global parameter, the banknode will send a Done message to the workstation. The workstation will check if the order limit object still exists. If it does not exist, then the workstation will ignore the message. Otherwise, it will check for any outstanding orders under this Order Limit. If there are any orders, it will log an error and will cancel all the remaining orders and will then remove the order limit object.

#### Trading Floor Administration (TFA) Functions

Preferably, at least one designated trader on each trading floor has the ability to set the following parameters:

##### a) Notional Amount Increment

The notional amount increment is a system-wide parameter (per currency) specifying the increment between notional amount values specified during order submission. All orders submitted into the system must have a notional amount that is a multiple of this value. This parameter (and the corresponding Order Size parameter of all orders entered into the system) is preferably specified in absolute terms.

##### b) Price Increment

The price increment specifies the granularity between prices for orders submitted into the system. The increment is defined for each tenor or tenor category defined in the database of valid FRA instruments, and is preferably specified in absolute terms.

##### c) Minimum Notional Amount

The minimum notional amount is a system-wide parameter specified for each currency that specifies the minimum notional amount of an order submitted or outstanding in the system. If the remaining amount of an order falls below this value, then the remaining amount is canceled. This value is preferably expressed in three-month-equivalent terms since FRAs with shorter gaps are conventionally traded with higher notional amounts than similar FRAs with longer gaps..

##### d) Maximum Notional Amount

The maximum notional amount is a system-wide parameter (per currency) that specifies the maximum notional amount of an order submitted into the system. This value is also preferably expressed in three-month-equivalent terms.

Alternatively, some or all of these parameters may be administered at a system level by a designated system administrator. In either case, the matching process in the Arbitrator, the order submission process in the individual workstations, and/or both have access to these parameters (and also to other system specified parameters not considered relevant to the present invention) when executing matches.

#### Overview of Deal Matching Process

A match is not allowed to proceed if the credit utilization as calculated exceeds the available credit set by the TFA.



Thus, even though prescreened for credit, a further check of bids, offers, buy and sell order credit compatibility is done as part of deal matching.

Orders that are compatible are matched by the dealing system. Newly submitted bid and buy orders are matched against outstanding offer orders. Newly submitted sell and offer orders are matched against outstanding bid orders.

A new bid or buy order is compatible to an existing offer or sell order if all of the following conditions are true:

The orders are for the same tenor.

The trade floors of the orders are credit compatible with respect to this order - or - the trade floors of the two orders are identical.

The price of the bid or buy order is greater than or equal to the offer or sell order.

The amounts of both orders are greater than or equal to the 3-month-equivalent of the system defined minimum notional amount parameter.

Any order submitted into the system is first matched against all existing bids and offers at the maker's Arbitrator. The existing orders are considered in price/time order in search of compatible orders. If a compatible order is found, the two orders are "matched" and a deal is initiated for the amount equal to the minimum of the two order amounts. The process continues until the remaining three-month-equivalent amount of the submitted order becomes less than the value of the minimum notional amount parameter, or until there are no compatible orders.

If the remaining three-month-equivalent amount of the submitted order is less than the value of the minimum notional amount parameter, the submitting workstation is informed accordingly and the order is canceled.

When a newly submitted order is not completely filled during the automatch process, the order becomes either a bid or offer in the dealing system's collection of outstanding orders. The amount of the outstanding order is equal to the amount that was not matched during the automatch process.

In order to complete a deal initiated during the automatch process, the dealing system must then verify in known fashion that both of the matched orders have not been removed by the trader and that there remains sufficient credit available to complete at least a system defined minimum deal size.

The final deal amount is lesser of the initial deal amount, the available credit from the first floor (or other associated first credit granting entity) to the second floor (or other associated first Credit Group), the available credit from the second floor (or other associated second credit granting entity) to the second floor (or other associated second Credit Group), and the available amount in any applicable Order Limit. If any of these amounts is less than the 3-month-equivalent of the minimum notional amount parameter, then the matching process for this deal fails.

When matching quotes that are associated with the safety net, the arbitrator will allow a deal size up to the quote amount, or the Available Amount from the safety net, whichever is less. The matched amount will be added to the Safety Net Pending Amount. When the deal is done, the matched amount will be subtracted from the Pending Amount and the deal amount (which may be less than the matched amount) will be added to the Dealt Amount field. The Available Amount will then be recalculated.

#### Deal Completion Process

After a deal is initiated it is considered pending until the floors notify the responsible Arbitrator of the deal's status or the deal times out.

The deal status reflects whether the deal was actually performed and what the amount of the deal was. The amount

could be different from the initial amount of the deal due to credit or Order Limit restrictions. The Market processor records the deal information. If the deal was executed for an amount smaller than the original amount, the remaining amount may be available for another match.

If the deal is subject to an Order Limit, the Dealt amount is increased by the final amount of the deal done. The Pending amount is reduced by the original amount of the deal.

If a deal fails to complete, the amount tentatively matched will be subtracted from the Pending Amount and the Available Amount (the original Safety net less any Dealt or Pending amounts) will be recalculated. The Safety Net completes when the Dealt Amount becomes equal to the Safety Net Amount. (Not when the Available Amount goes to zero, because the entire matched amount may not be dealt, thereby increasing the Available Amount to more than the Minimum Notional amount) At the same time, any outstanding quotes associated with the safety net are completed. No new quotes can be submitted under the same safety net. Any outstanding deals are allowed to finish normally.

#### Exemplary Trading System Architecture

In the described embodiment and as shown in FIG. 5, the trading system is an electronic brokerage system having a communication network for facilitating the buying and selling of futures by traders each associated with his own Workstation ("WS") located at a trading floor of a subscriber bank ("client site") and connected to a central Arbitrator (ARB), with at least the price and other market related data that is destined for more than one Market Access Node flowing through a shared Market Distributor (MD) node. For the most part, the hardware and most of the software used in this exemplary system is based on the current EBS system for foreign exchange and described in some detail in the referenced US patent, to which reference may be made. However, in part because a FRA involves only one currency, there are fewer interregional trades between geographically separated trading regions, and the overall design may be simplified by providing only one Arbitrator node. However, it may nevertheless be desirable to utilize the distributed credit utilization and dealable price screening functionality pioneered by the known EBS system. In particular, a single central Arbitrator could be dedicated to FRA trades, while several regional Arbitrators are collectively dedicated to spot FX trades, sharing the existing EBS communication network and trader workstations.

Although the existing EBS architecture (hardware and software) can be as the base for the above described FRA trading system; any required changes will be largely isolated to the Graphical User Interface (GUI) on the Workstation and in the imposition of Order Limits (both of which being described in detail above) and the credit processing on the Banknode (which is the disclosed in a copending PCT application entitled "Communication of Credit Filtered Prices in an Electronic Brokerage System", which is hereby incorporated by reference). The rest of the EBS system architecture (price making, price taking, price distribution, deal matching, system administration, etc.) may be utilized by the individual FRA tenors in a manner analogous to individual currency pairs in the known EBS spot foreign exchange dealing system.

It should be noted that a single central computer system could be used to implement the various functions described above. The system of this alternative embodiment would thus comprise a plurality of workstations connected by a network to a central computer system. This is a simpler, but non-preferred, implementation. The distributed embodiment described is considered to be a more robust and secure design.

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What is claimed is:

1. In a computerized trading system for permitting a trader to submit orders for display and acceptance by other traders, an improved multiple order facility comprising:

sheet means for simultaneously displaying current market prices for a plurality of related financial instruments;

multiple selection means for selecting at least two of said plurality of related instruments;

price means for manually adjusting an associated price parameter for each of the selected instruments;

order limit means for simultaneously setting an associated size parameter for all the selected instruments to a common order limit; and

submission means for submitting respective orders each including a respective price parameter and a respective size parameter for each of the selected instruments to the other traders;

wherein after any of the submitted orders subject to the common order limit is dealt on by any of the other traders for a particular deal size, the order limit means automatically reduces the size parameter of each of the other submitted orders subject to that same common order limit by an amount corresponding to that deal size.

2. The multiple order facility of claim 1, wherein the common order limit is established by the trader submitting the selected instruments, the selected instruments in at least one said multiple order are not subject to such a common order limit, and

the facility further comprises size means for manually adjusting the individual size parameters for at least those selected instruments not subject to any such common order limit.

3. The multiple order facility of claim 1, wherein the orders submitted by the submitting means include bids and offers from market makers and buy and sell orders from market takers

the multiple selection means presents a market maker with a current market default price for those selected instruments for which a market price currently exists and a blank price for those selected instruments for which a market price does not currently exist; and

the price means is adapted to be manipulated by the market maker to individually adjust the price of each of the selected instruments.

4. The multiple order facility of claim 3, wherein the multiple selection means presents a market taker with a current market default price only for those selected instruments for which a market price currently exists; and

the price means is adapted to be manipulated by the market maker to individually adjust the price of each of the instruments presented to the market taker by the multiple selection means.

5. The multiple order facility of either of claims 3 or 4, further comprising group price means for simultaneously adjusting by a predetermined increment the prices of all of the instruments presented by the multiple selection means.

6. The multiple order facility of claim 5 further comprising

group size means for simultaneously adjusting by a predetermined increment the sizes of all of the instruments presented by the multiple selection means.

7. In a computerized trading system for permitting a first trader to submit a plurality of orders for display and acceptance by other traders, an improved multiple order facility comprising:

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(a) means for permitting the first trader to simultaneously generate a plurality of orders by:

(1) selecting a plurality of financial instruments from a displayed list of related financial instruments, each selected financial instrument being associated with a respective one of the orders;

(2) selecting a common quantity to be applied to each of the orders;

(3) selecting, for each respective order, a respective price at which the first trader is willing to buy or sell the financial instrument associated with that order; and

(4) sending each of the orders to a plurality of other traders using the computerized trading system; and

(b) means displaying the orders at the terminals of the other traders to whom the orders were sent, each displayed order showing:

(1) the price for the financial instrument associated with the order as selected by the first trader; and

(2) an available quantity of the financial instrument associated with the order, the available quantity initially being equal to the common quantity set by the first trader and being reduced whenever a deal is made on any of the plurality of orders.

8. The improved multiple order facility of claim 7, wherein the available quantity is reduced by an amount equal to the monetary value of any deal made on any of the plurality of orders.

9. The improved multiple order facility of claim 8, wherein a deal is made when all or part of one of the orders made by the first trader is accepted by one of the other traders.

10. The improved multiple order facility of claim 7, wherein the orders are bids and offers from market makers.

11. The improved multiple order facility of claim 10, wherein the first trader is presented with information concerning available market prices for the financial instruments selected.

12. The improved multiple order facility of claim 11, wherein the information concerning market prices is provided at least at the time that the first trader selects, for each respective order, the price at which the first trader is willing to buy or sell the financial instrument associated with that order.

13. The improved multiple order facility of claim 7, wherein the orders are buy and sell orders from market makers.

14. The improved multiple order facility of claim 13, wherein the first trader is presented with information concerning available market prices for the financial instruments selected.

15. The improved multiple order facility of claim 14, wherein the available market price information is presented at least at the time that the first trader selects, for each respective order, the price at which the first trader is willing to buy or sell the financial instrument associated with that order.

16. The improved multiple order facility of claim 14, wherein the available market price information is presented at least at the time that the first trader selects, for each respective order, the price at which the first trader is willing to buy or sell the financial instrument associated with that order.

17. The improved multiple order facility of claim 7, wherein the means for permitting allows the first trader to select the price for each respective order by manually varying a default price, the default price being set equal to



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an available market price for the financial instrument associated with that order.

18. A process for submitting a plurality of orders for display and acceptance by other traders, comprising:

(a) a first trader simultaneously generating a plurality of orders by:

(1) selecting a plurality of financial instruments from a displayed list of related financial instruments, each selected financial instrument being associated with a respective one of the orders;

(2) selecting a common quantity to be applied to each of the orders;

(3) selecting, for each respective order, a respective price at which the first trader is willing to buy or sell the financial instrument associated with that order; and

(4) sending each of the orders to a plurality of other traders using the computerized trading system; and

(b) displaying the orders at the terminals of the other traders to whom the orders were sent, each displayed order showing:

(1) the price for the financial instrument associated with the order as selected by the first trader; and

(2) an available quantity of the financial instrument associated with the order, the available quantity initially being equal to the common quantity set by the first trader and being reduced whenever a deal is made on any of the plurality of orders.

19. The process of claim 11, wherein the available quantity is reduced by an amount equal to the monetary value of any deal made on any of the plurality of orders.

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20. The process of claim 19, wherein a deal is made when all or part of one of the orders made by the first trader is accepted by one of the other traders.

21. The improved multiple order facility of claim 18, wherein the orders are bids and offers from market makers.

22. The improved multiple order facility of claim 21, wherein the first trader is presented with information concerning available market prices for the financial instruments selected.

23. The improved multiple order facility of claim 22, wherein the information concerning market prices is provided at least at the time that the first trader selects, for each respective order, the price at which the first trader is willing to buy or sell the financial instrument associated with that order.

24. The improved multiple order facility of claim 18, wherein the orders are buy and sell orders from market makers.

25. The improved multiple order facility of claim 24, wherein the first trader is presented with information concerning available market prices for the financial instruments selected.

26. The improved multiple order facility of claim 18, wherein the first trader selects the price for each respective order by manually varying a default price, the default price being set equal to an available market price for the financial instrument associated with that order.

\* \* \* \* \*



US006453420B1

(12) **United States Patent**  
**Collart**

(10) **Patent No.:** **US 6,453,420 B1**  
(45) **Date of Patent:** **Sep. 17, 2002**

(54) **SYSTEM, METHOD AND ARTICLE OF MANUFACTURE FOR AUTHORIZING THE USE OF ELECTRONIC CONTENT UTILIZING A LASER-CENTRIC MEDIUM**

(75) **Inventor:** **Todd R. Collart, Los Altos, CA (US)**

(73) **Assignee:** **Research Investment Network, Inc., Irvine, CA (US)**

(\*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(22) **Filed:** **Apr. 21, 1999**

(51) **Int. Cl.<sup>7</sup>** ..... **G06F 12/14**

(52) **U.S. Cl.** ..... **713/201; 705/51; 705/57; 705/58; 380/201; 380/202**

(58) **Field of Search** ..... **713/200, 201; 709/219, 217; 705/51, 55, 56; 380/201, 202, 203; 711/100, 154, 163**

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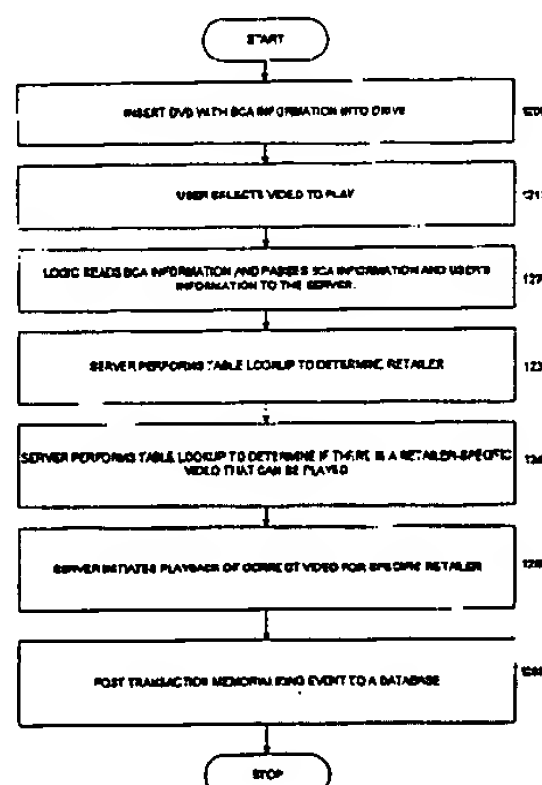
*Primary Examiner*—Ly V. Hua

(74) *Attorney, Agent, or Firm*—Keiji Masaki; Steve A. Wong

(57) **ABSTRACT**

A system, method, and article of manufacture is provided for tracking the distribution of content electronically. First, an electronic storage medium tracking identifier is incorporated onto an electronic storage medium and stored on a database. Next, a package tracking identifier is situated onto a package in which the electronic storage medium is stored. The electronic storage medium is then tracked while being shipped between various entities using the tracking identifier on the package. Further, the electronic storage medium may be identified using the tracking identifier on the electronic storage medium in order to afford authorized use of the information contained on the electronic storage medium.

**20 Claims, 24 Drawing Sheets**



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DVD life Cycle (pre-InterActual)

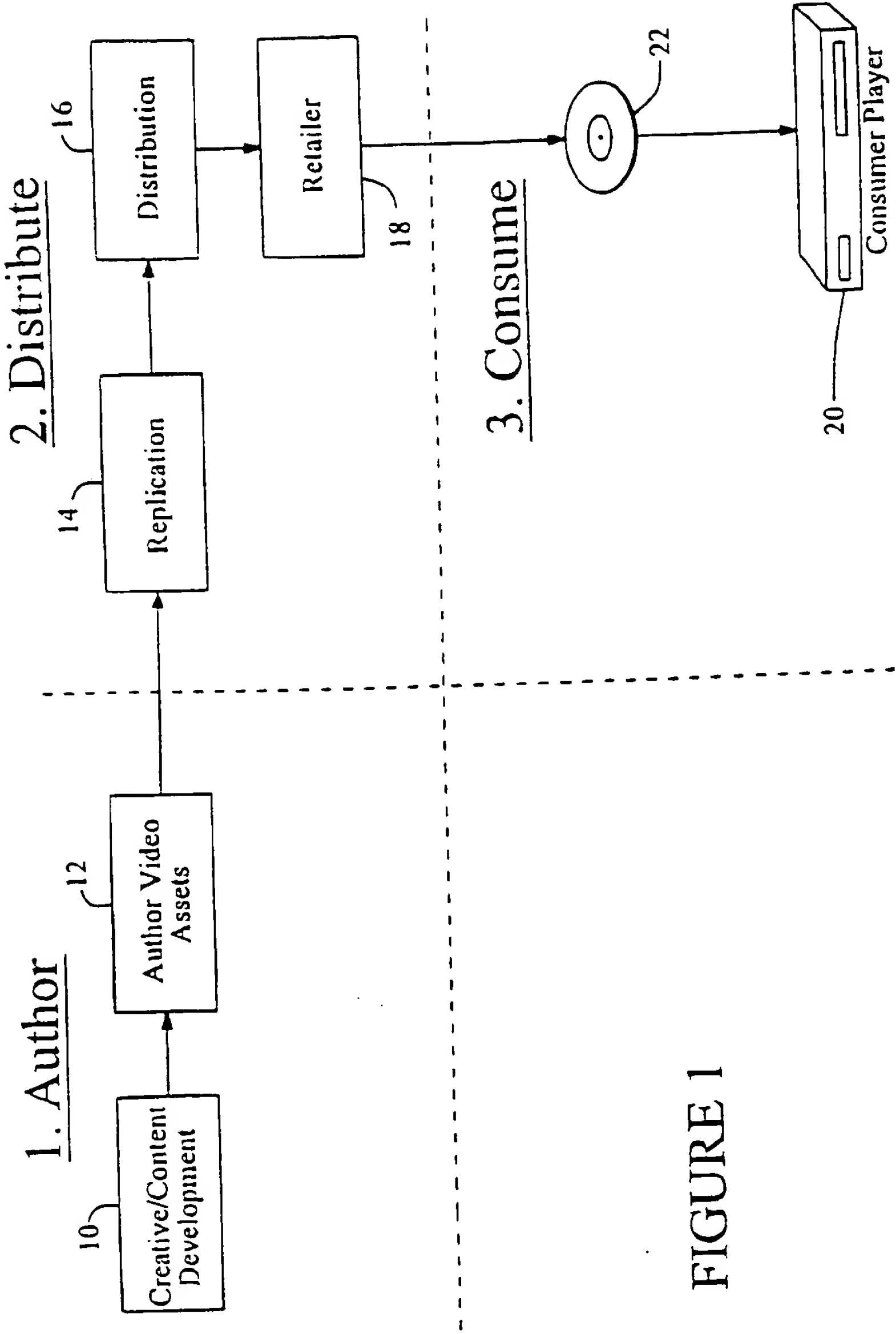
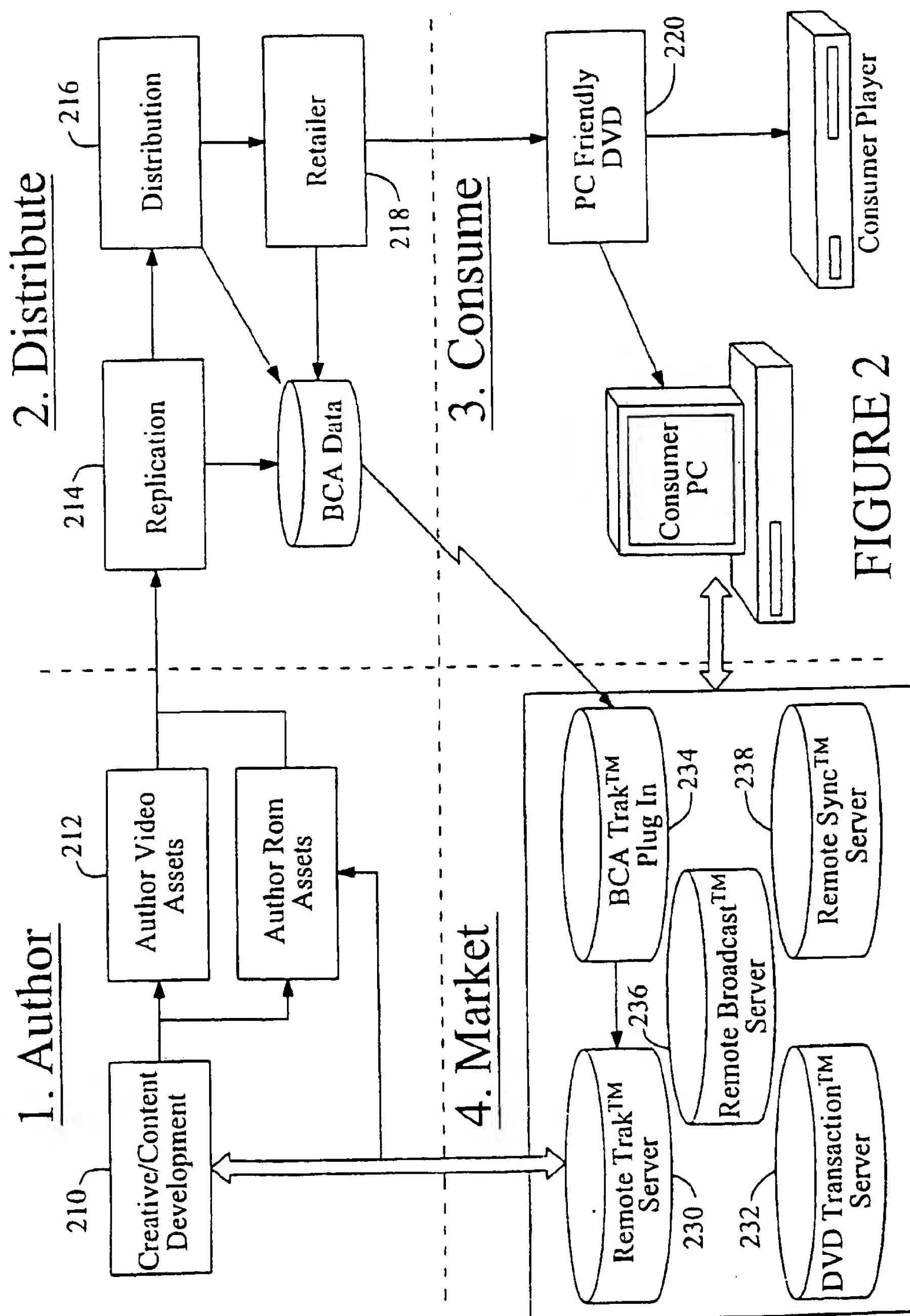
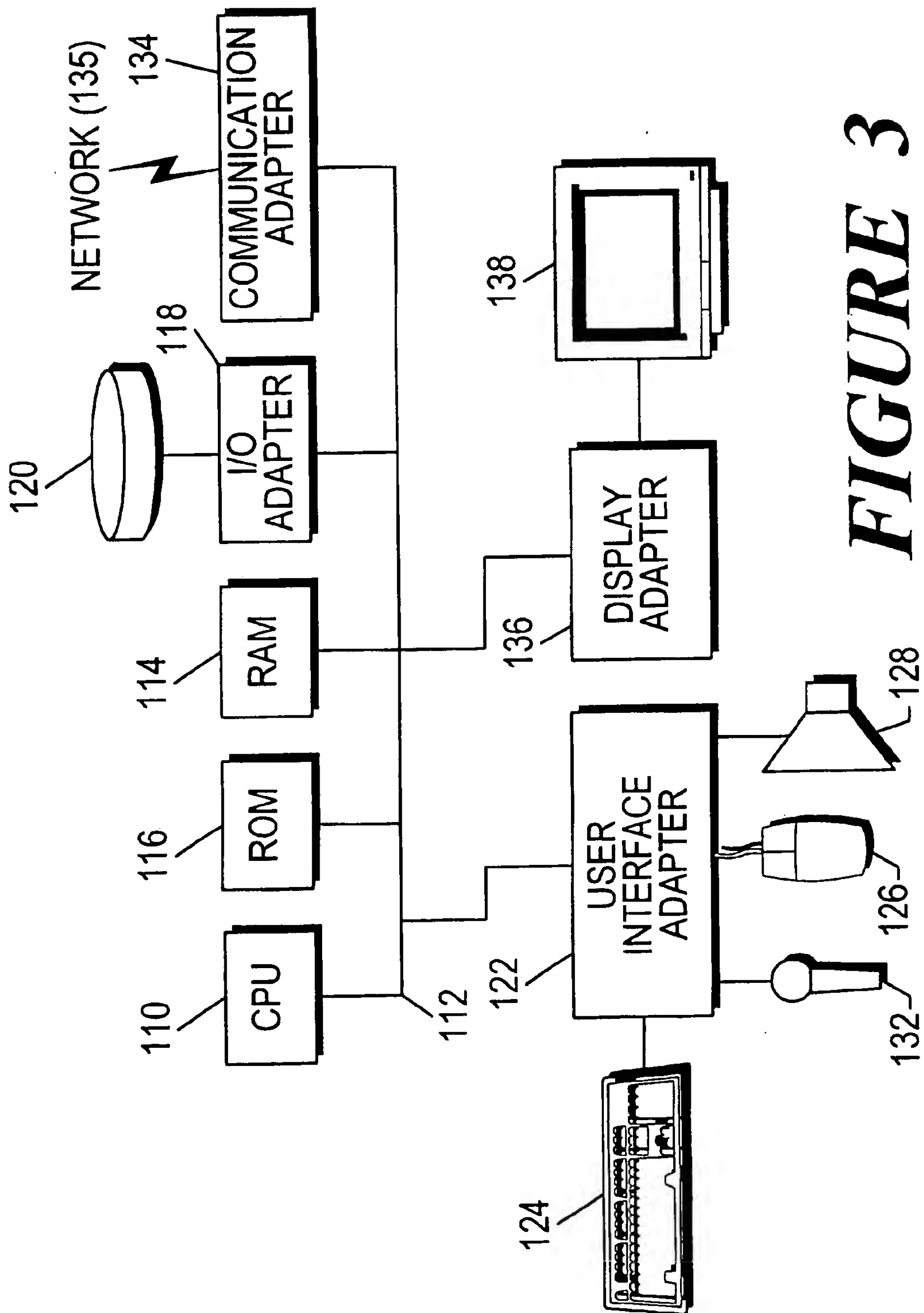


FIGURE 1





**FIGURE 3**

### DVD life Cycle (pre-InterActual)

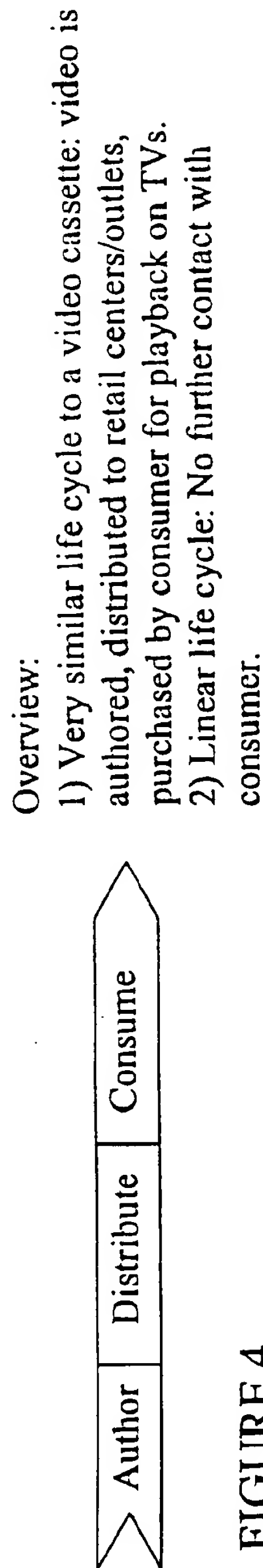
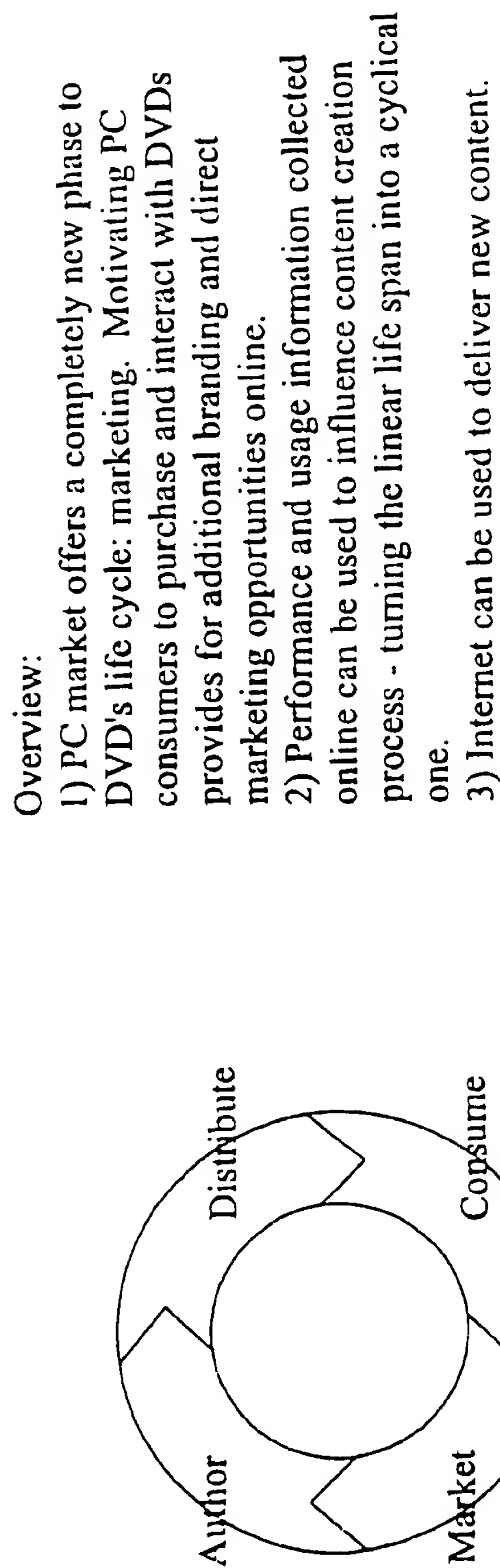


FIGURE 4

### DVD life Cycle (w/InterActual's Software)



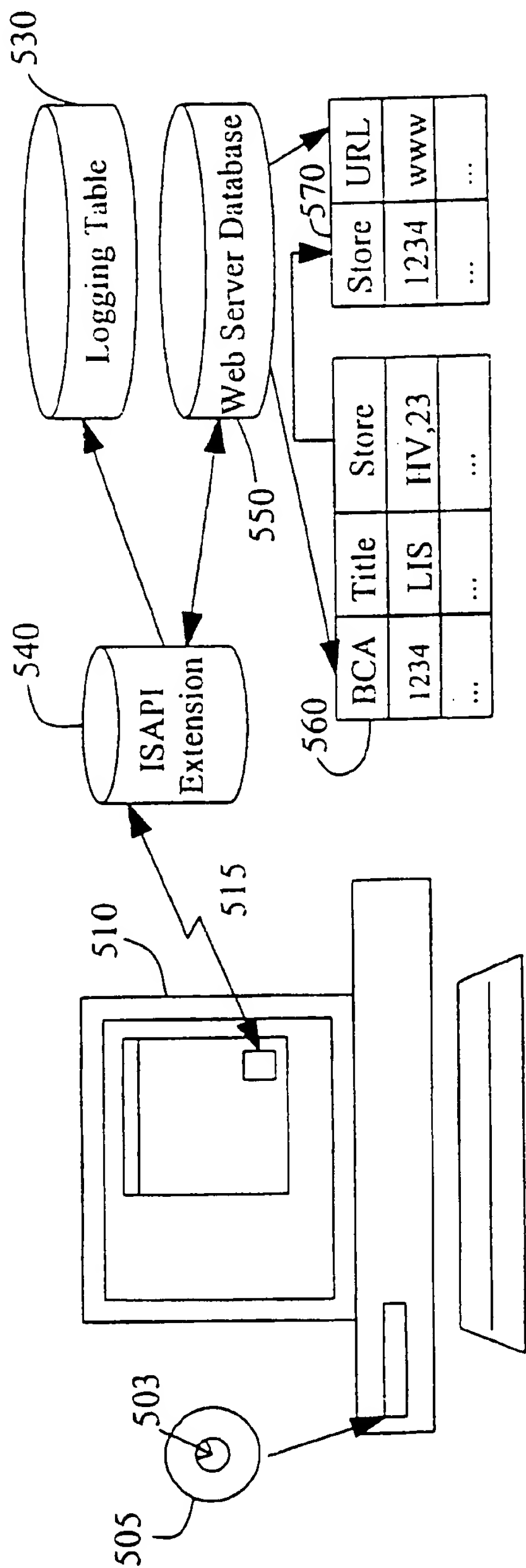


FIGURE 5

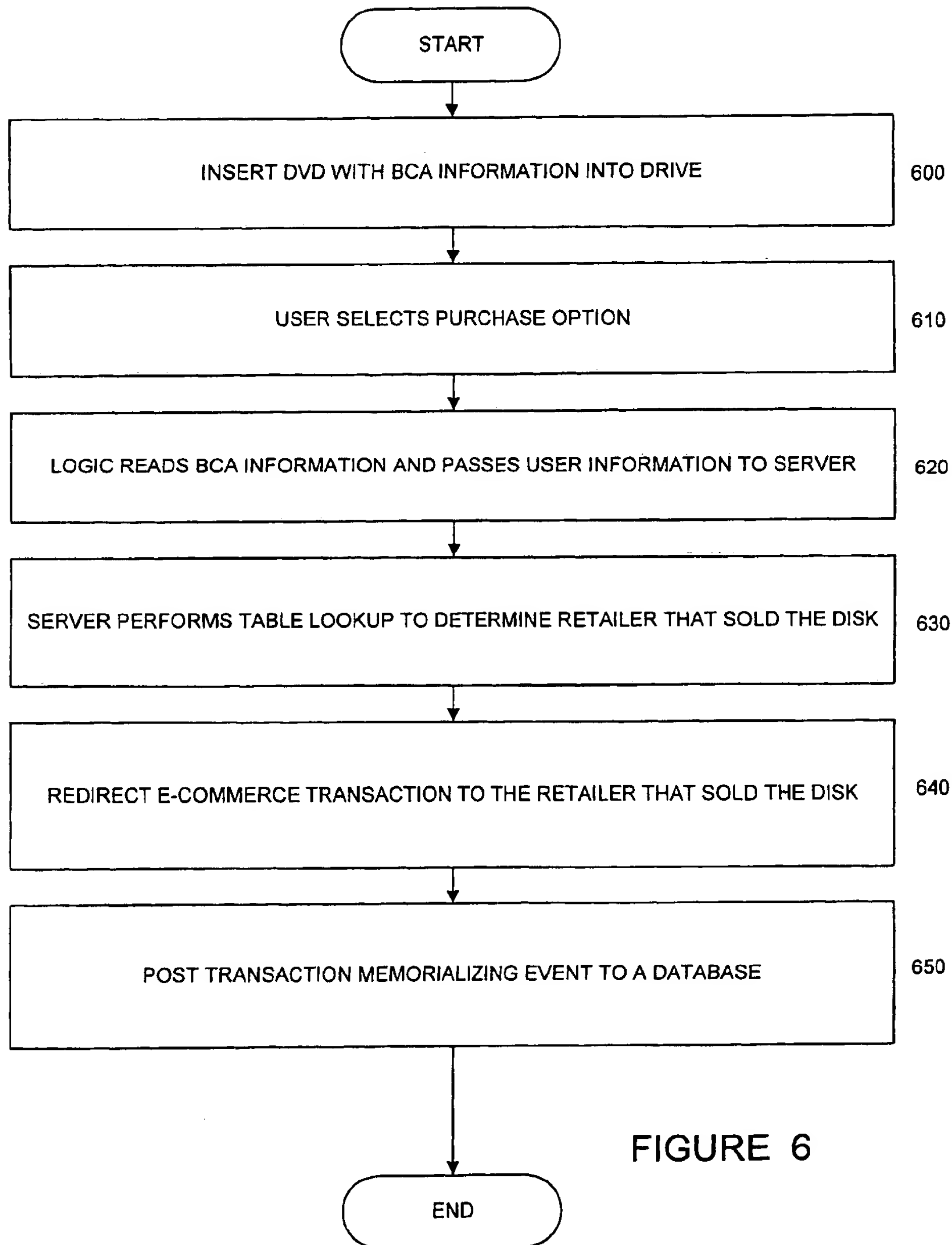


FIGURE 6

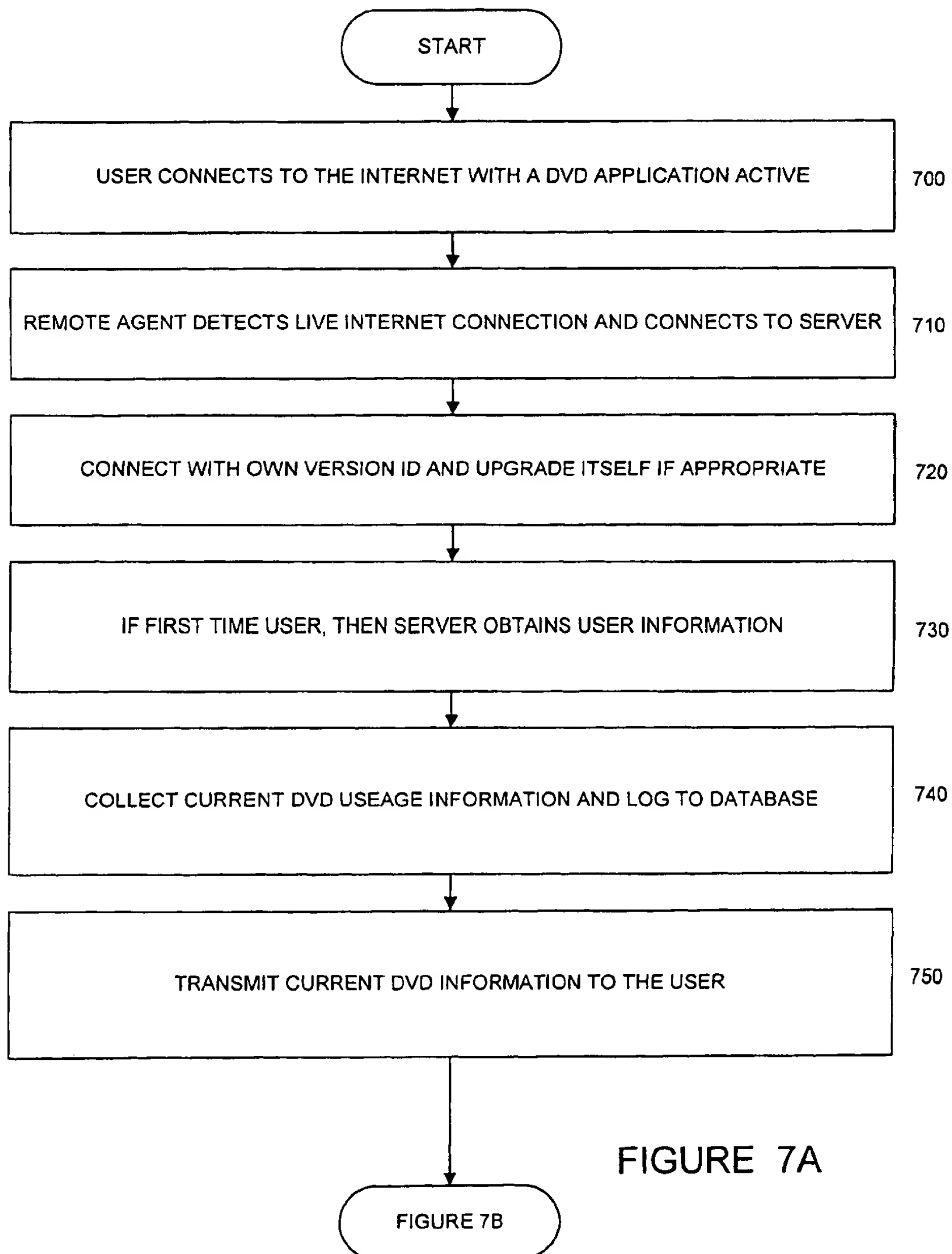


FIGURE 7A

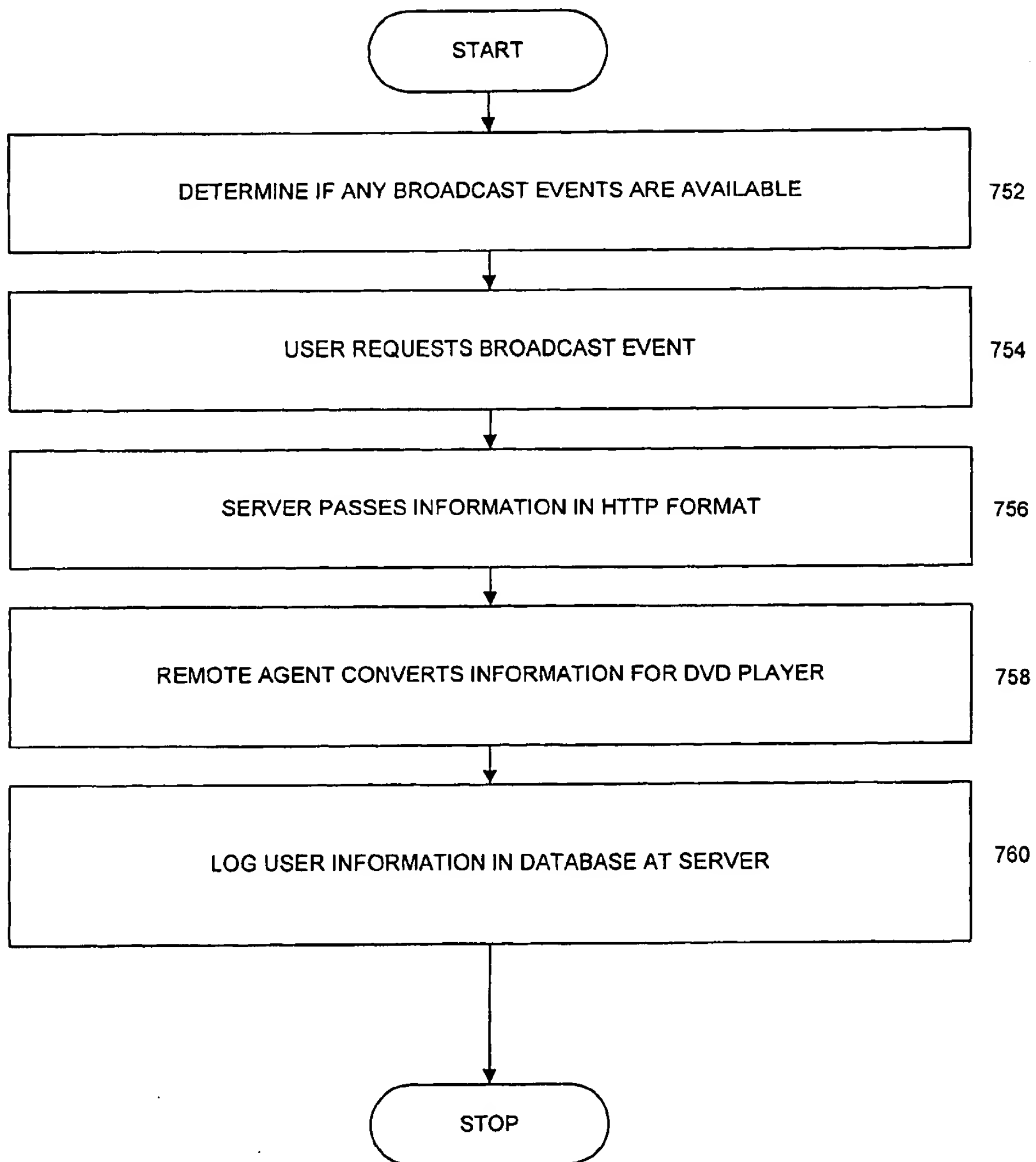


FIGURE 7B



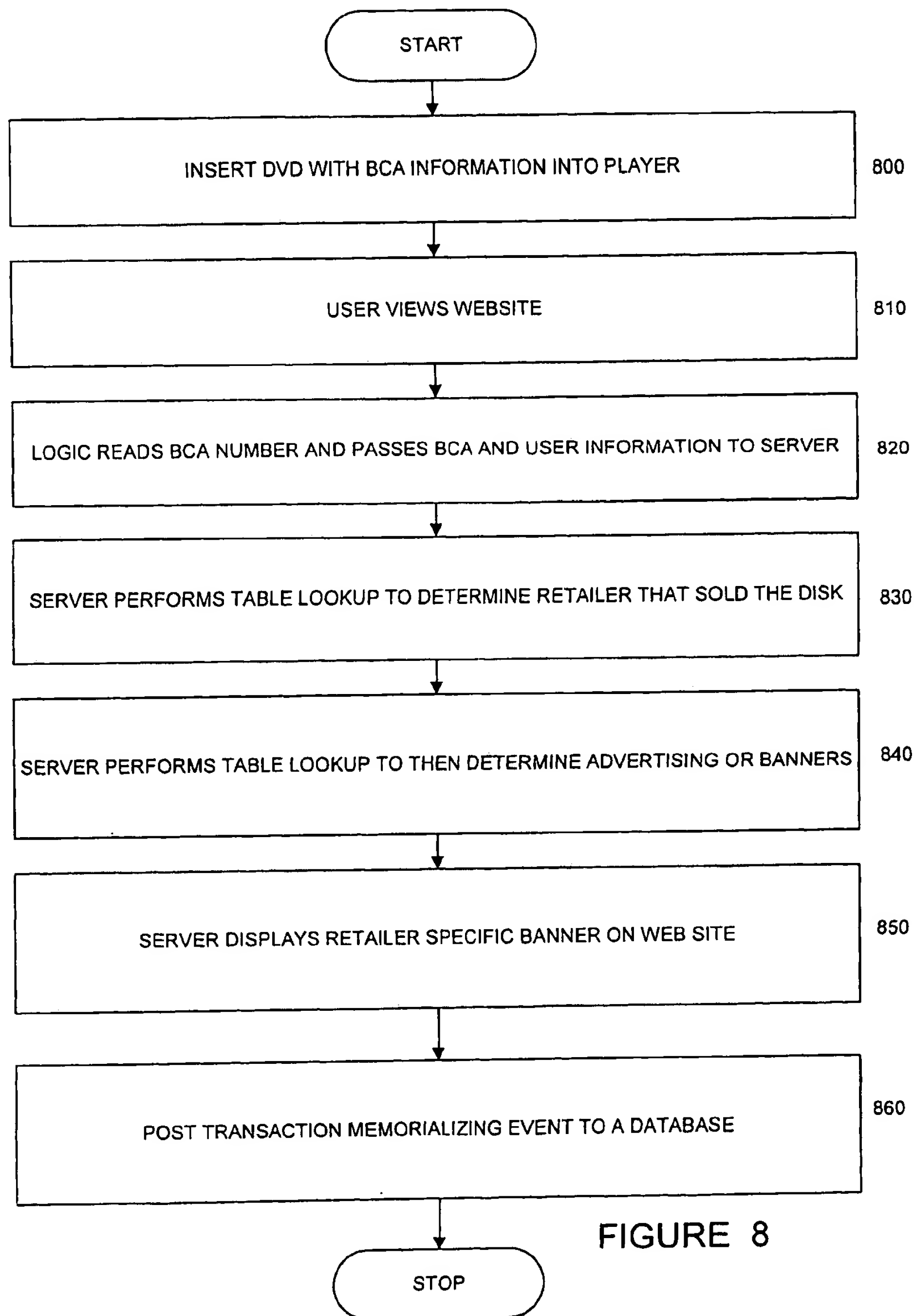


FIGURE 8

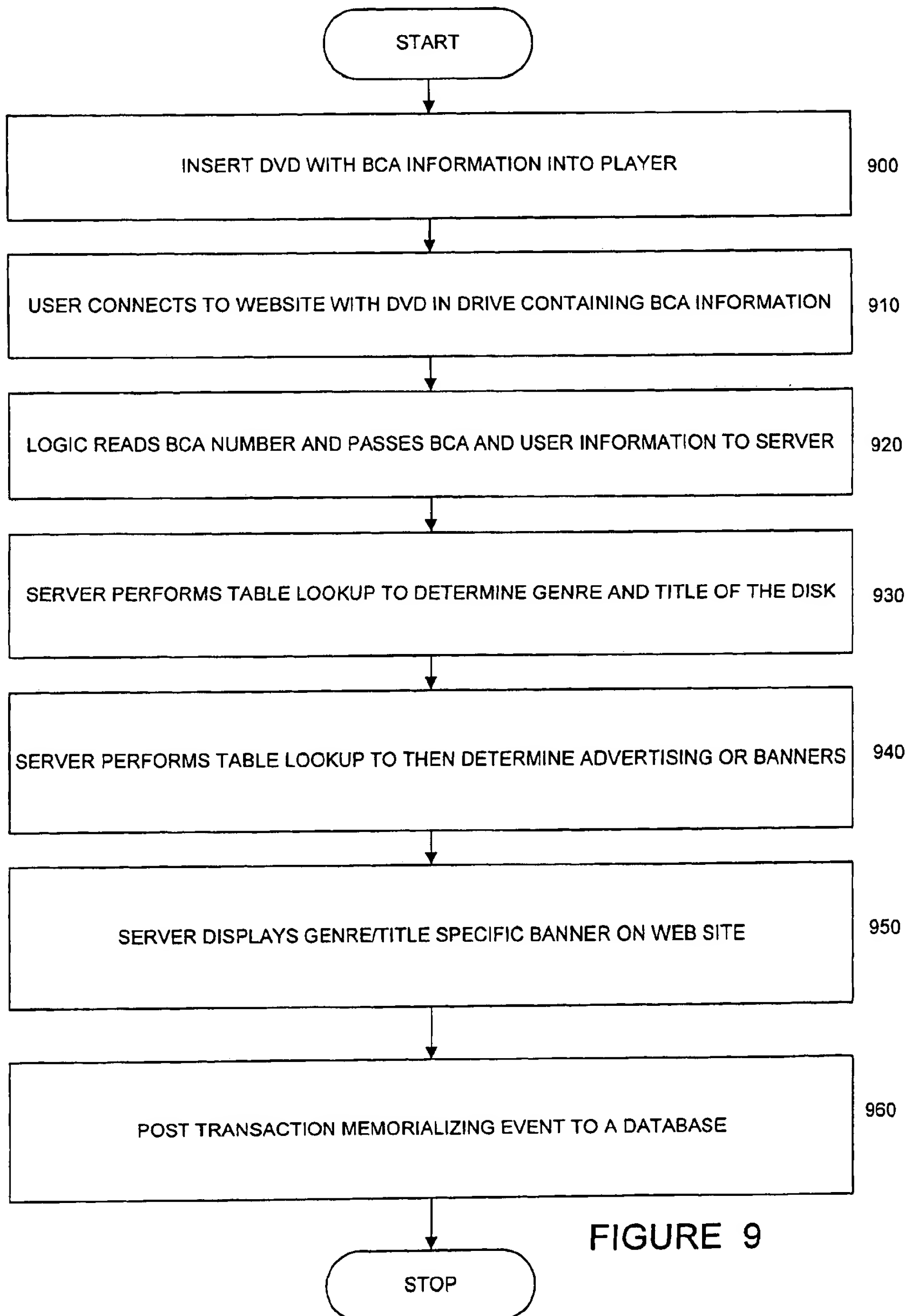


FIGURE 9

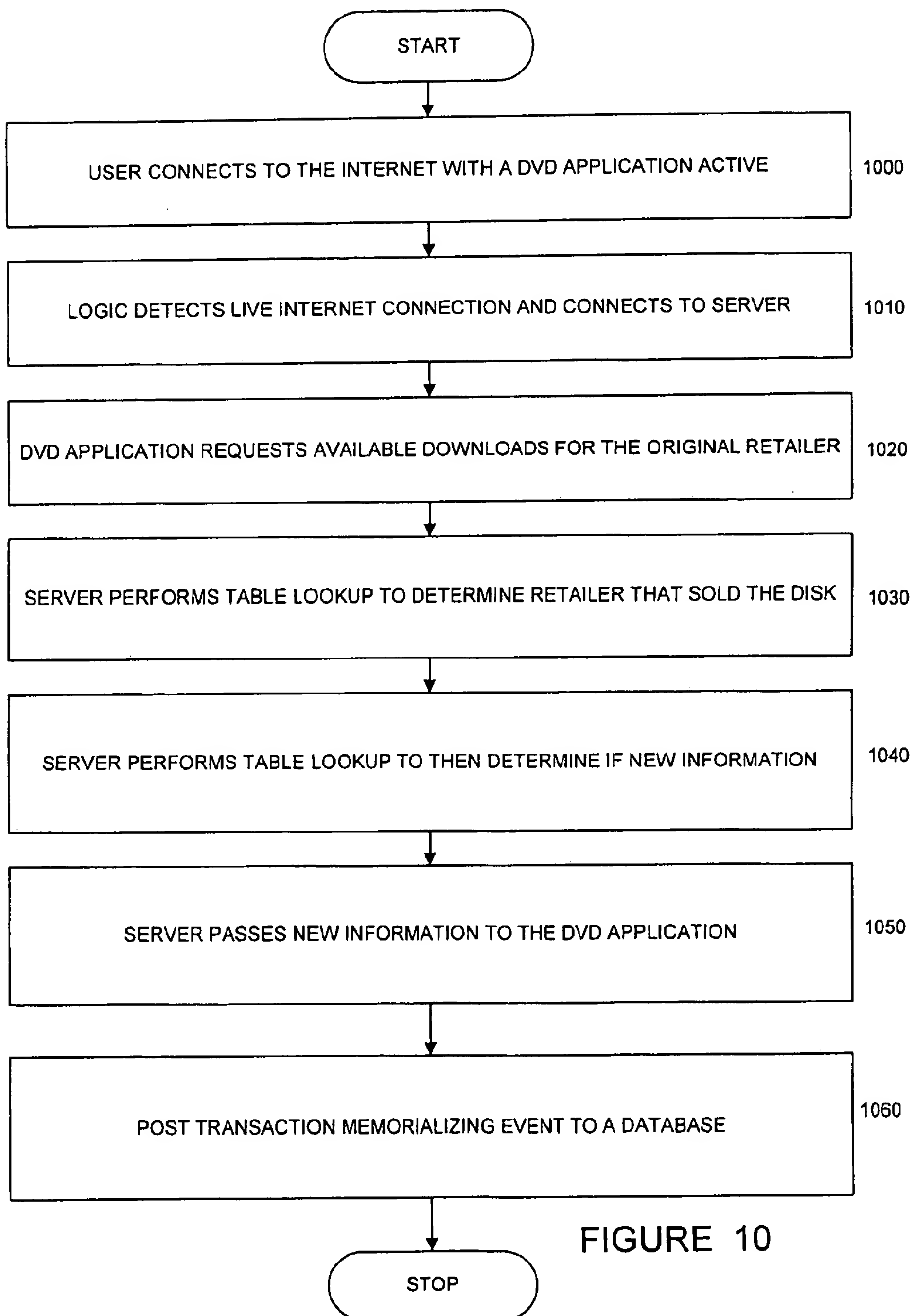


FIGURE 10

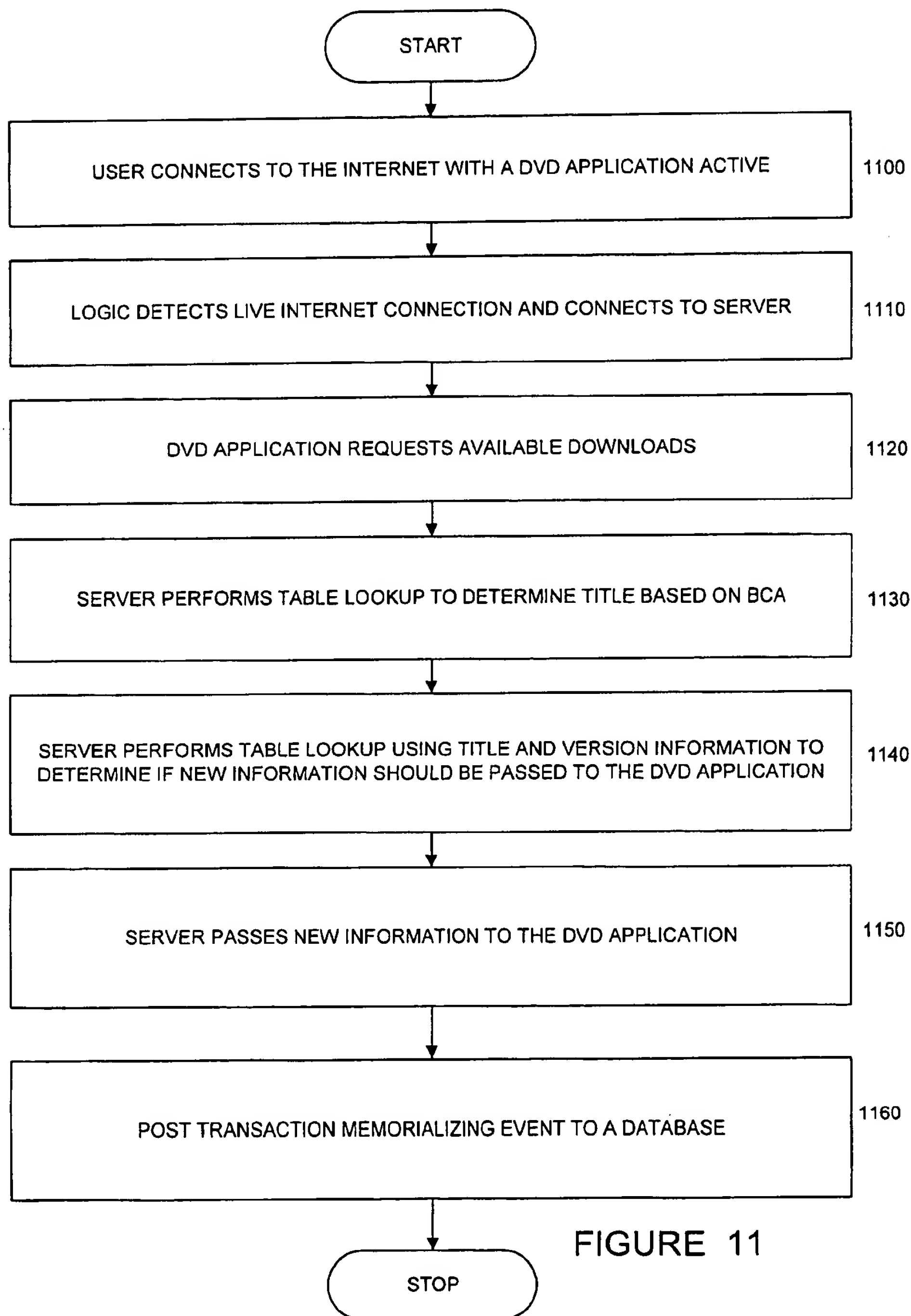


FIGURE 11

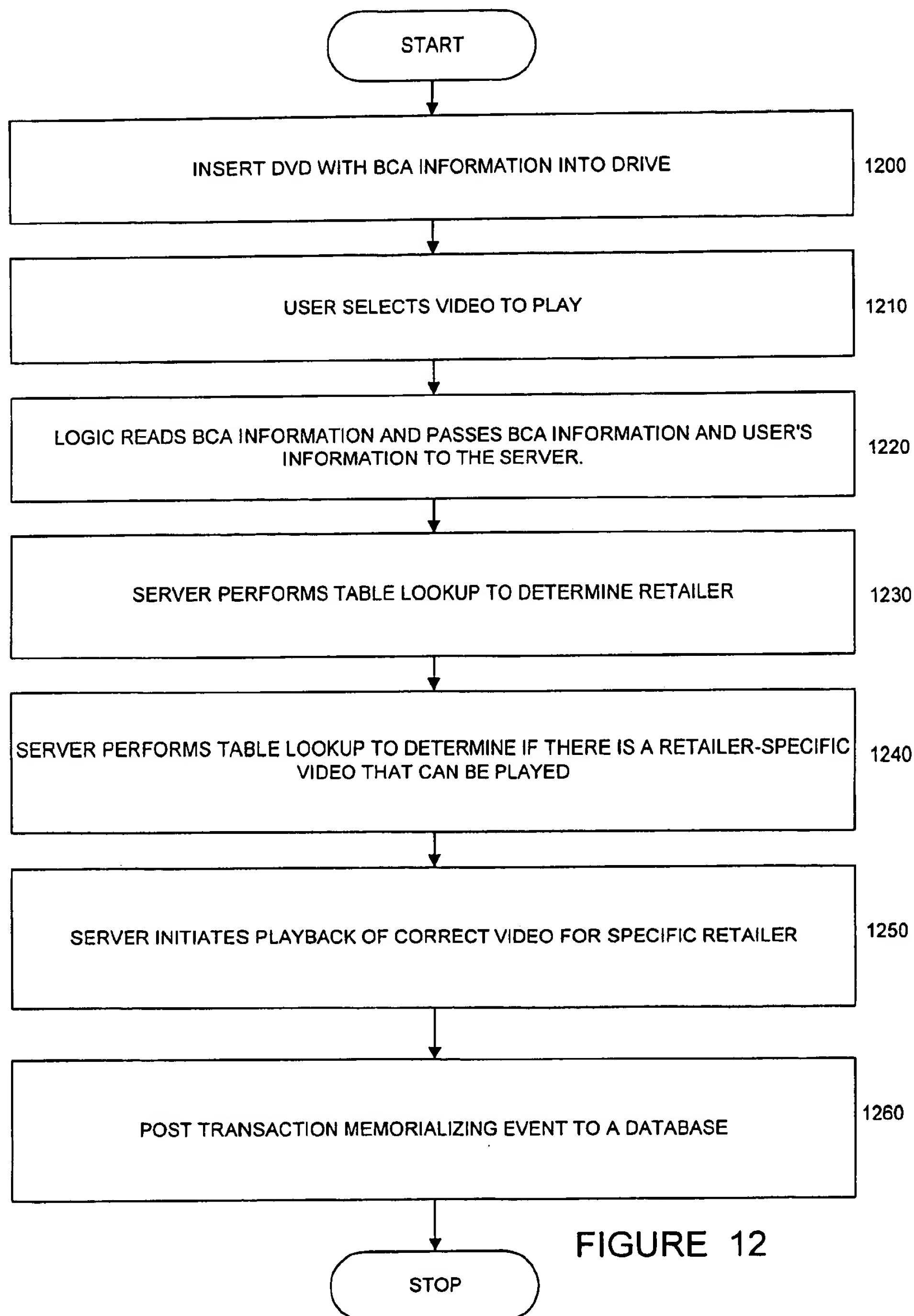


FIGURE 12

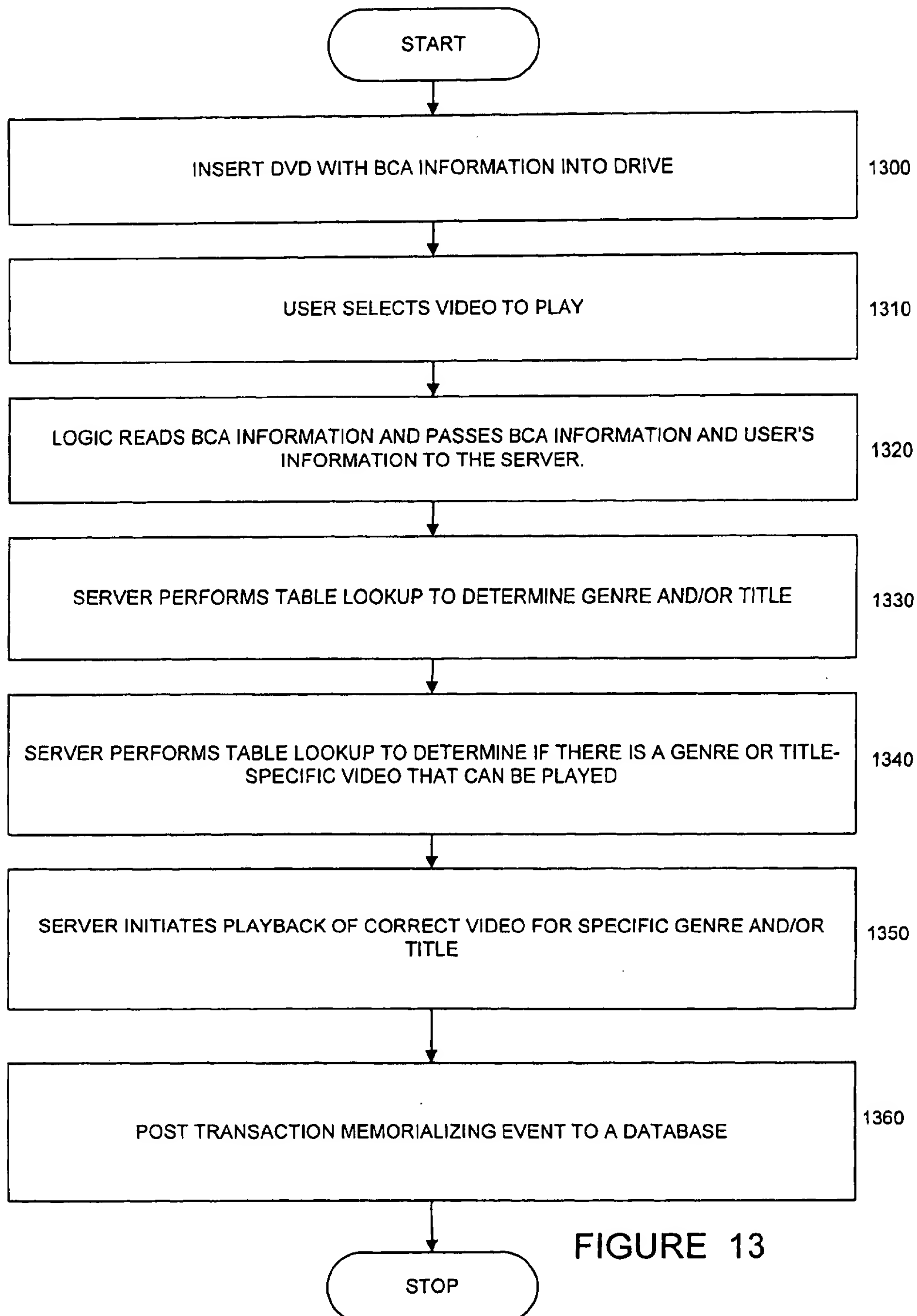


FIGURE 13



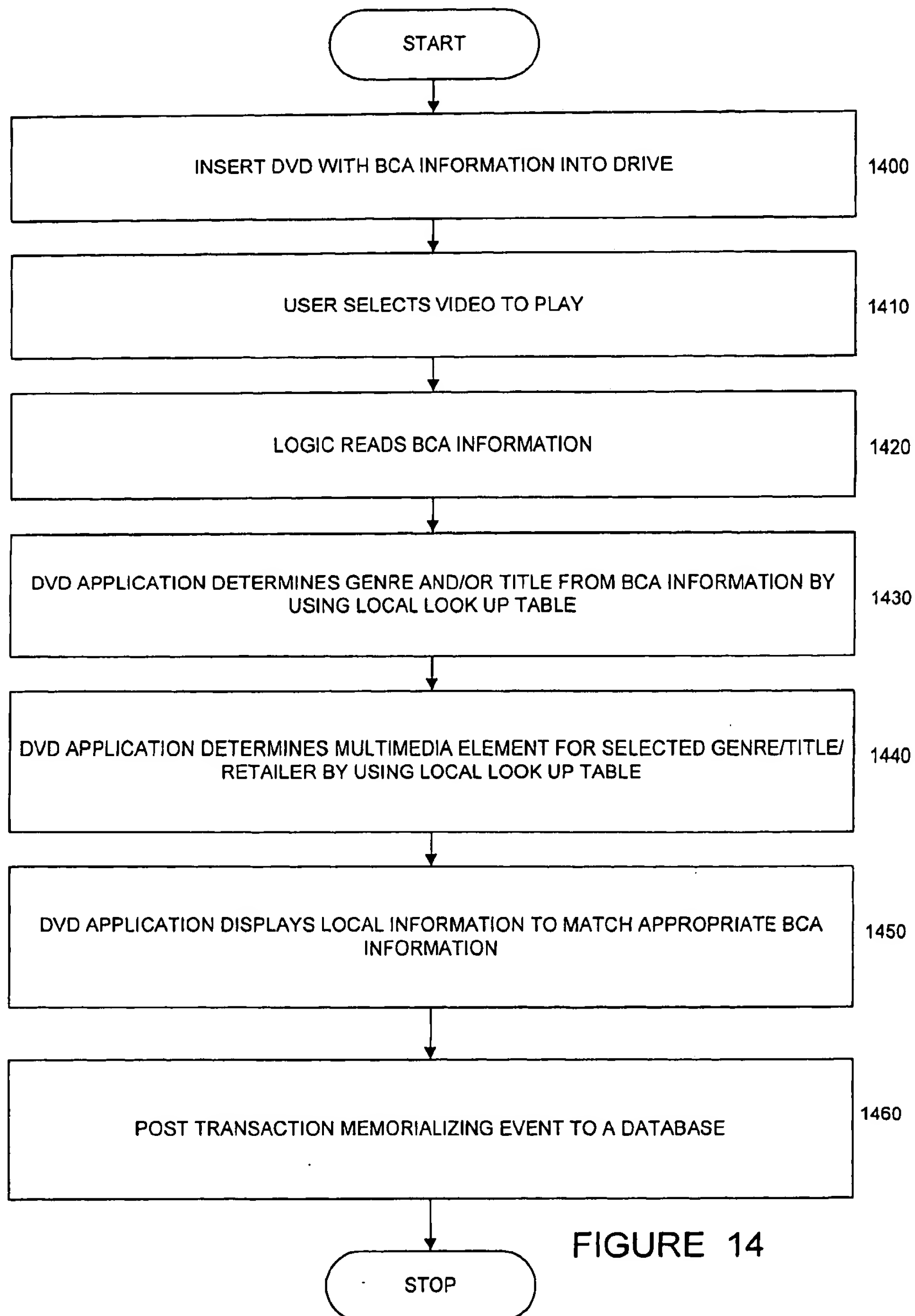


FIGURE 14

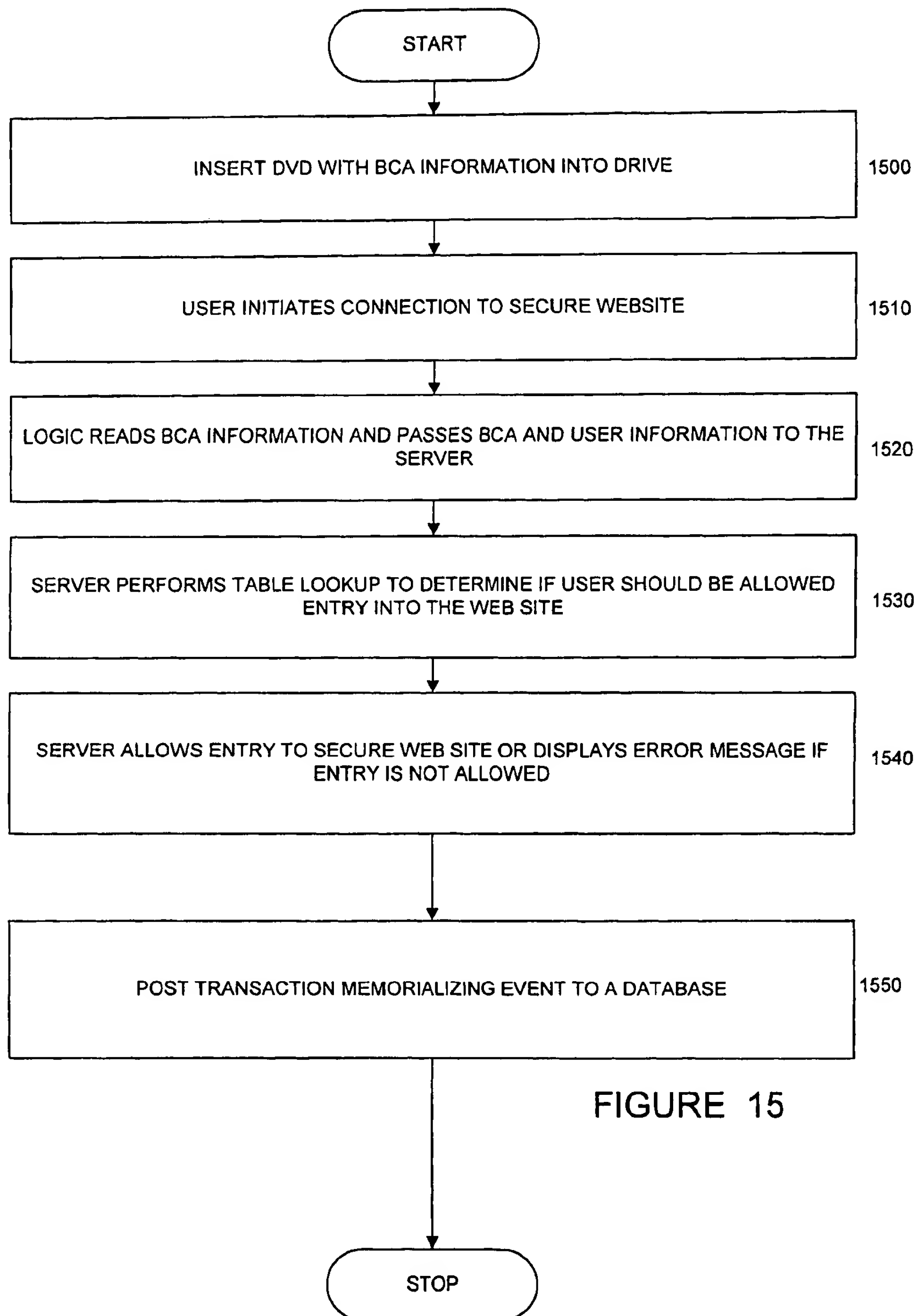


FIGURE 15

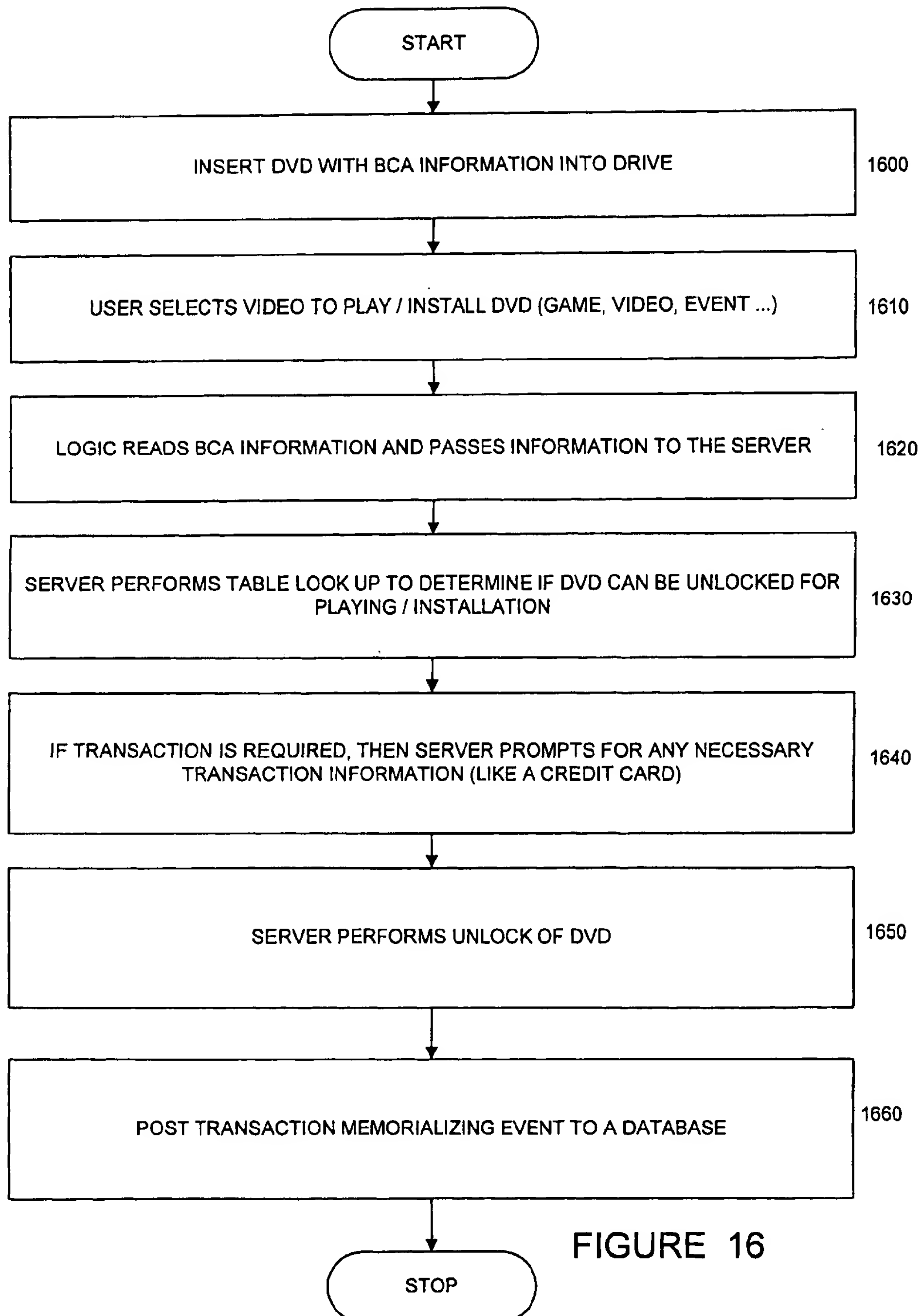


FIGURE 16

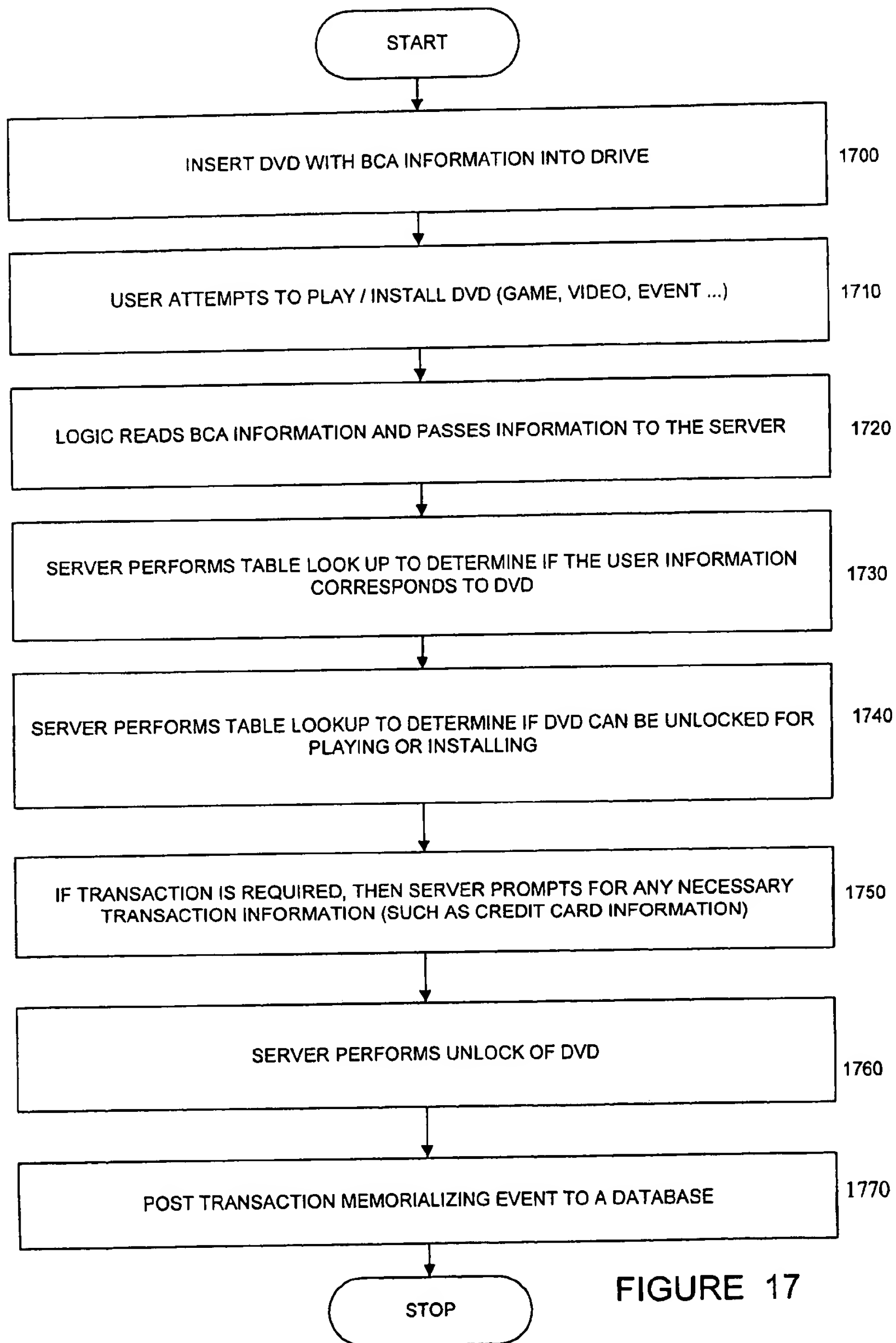


FIGURE 17

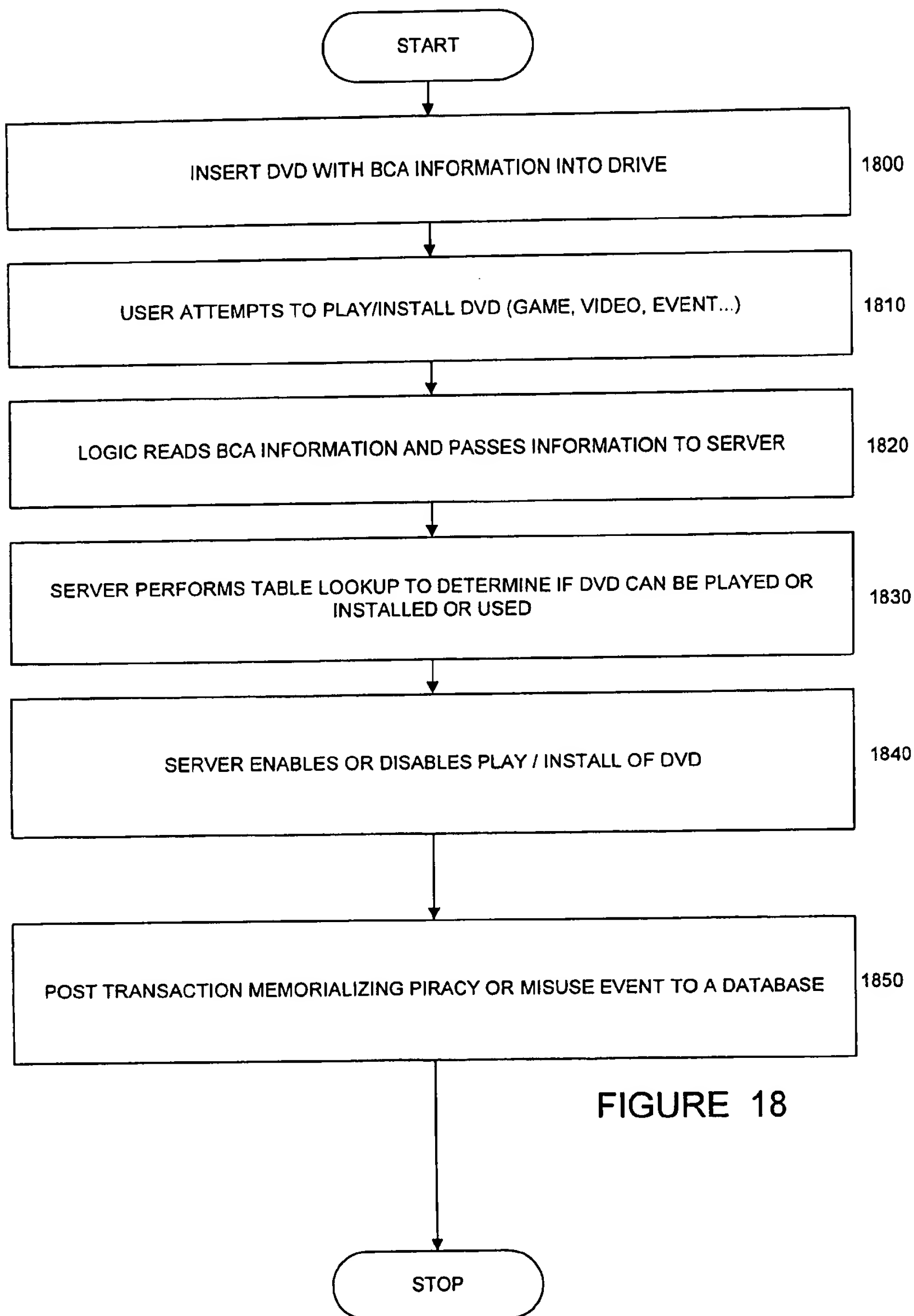
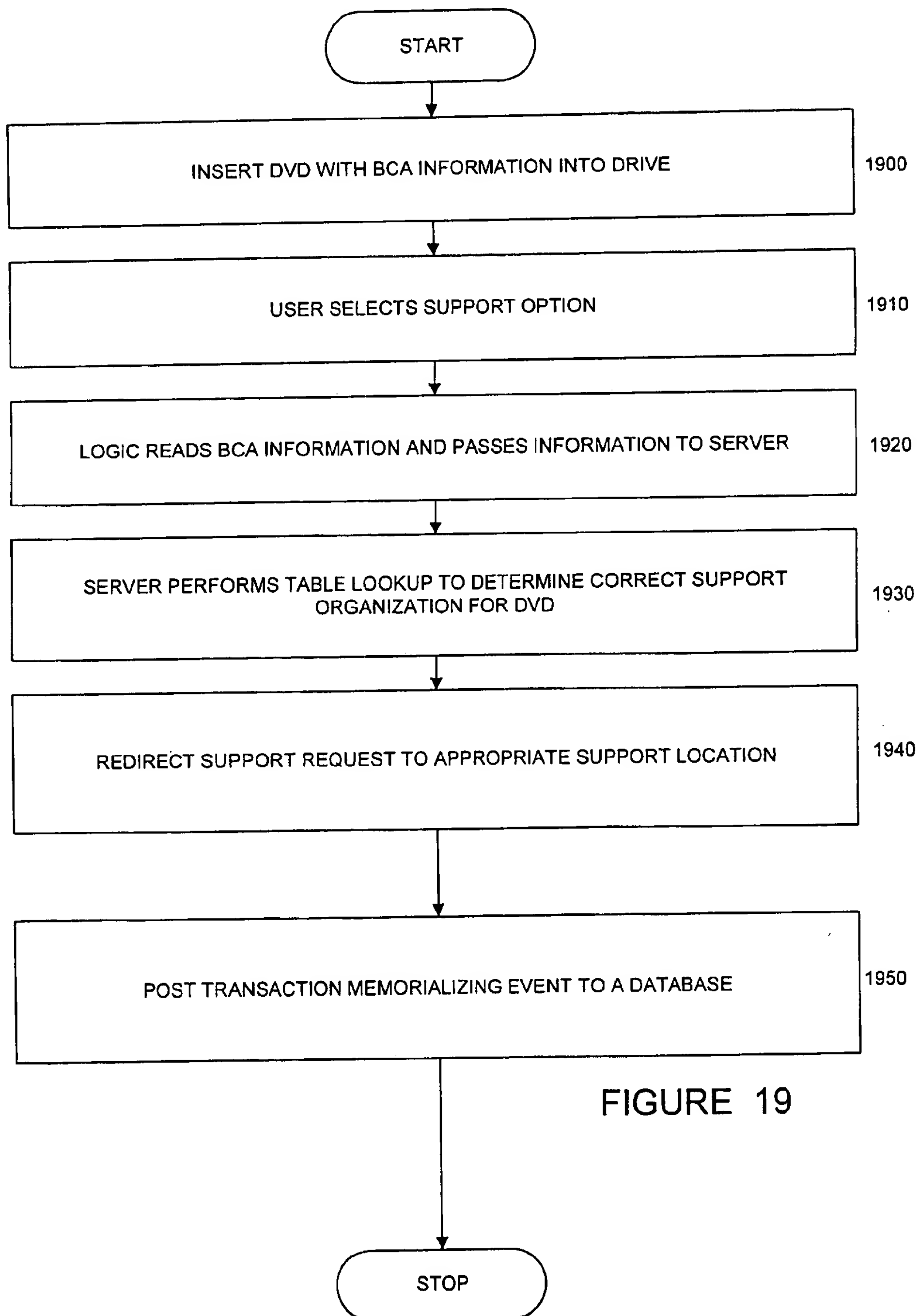


FIGURE 18





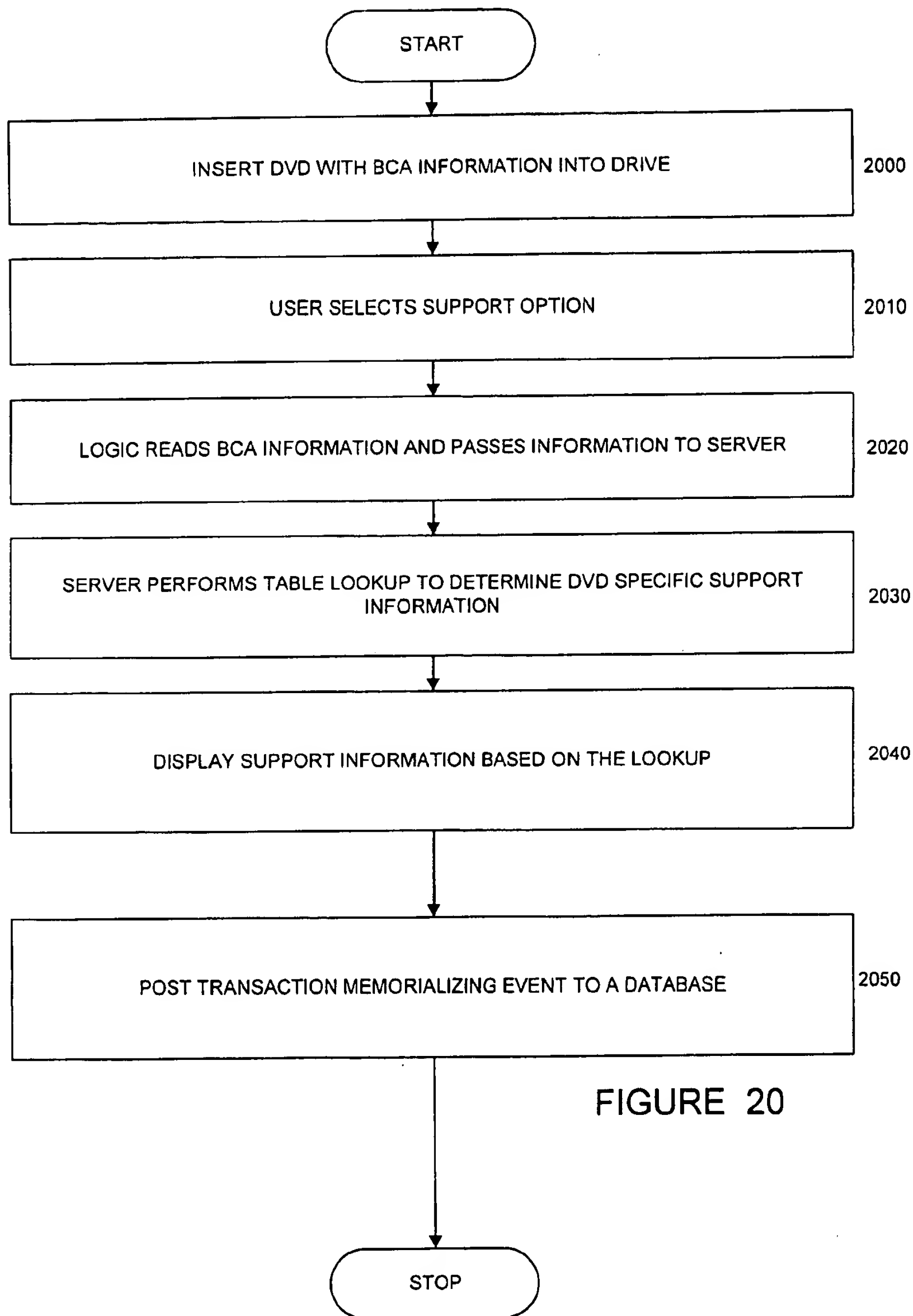


FIGURE 20

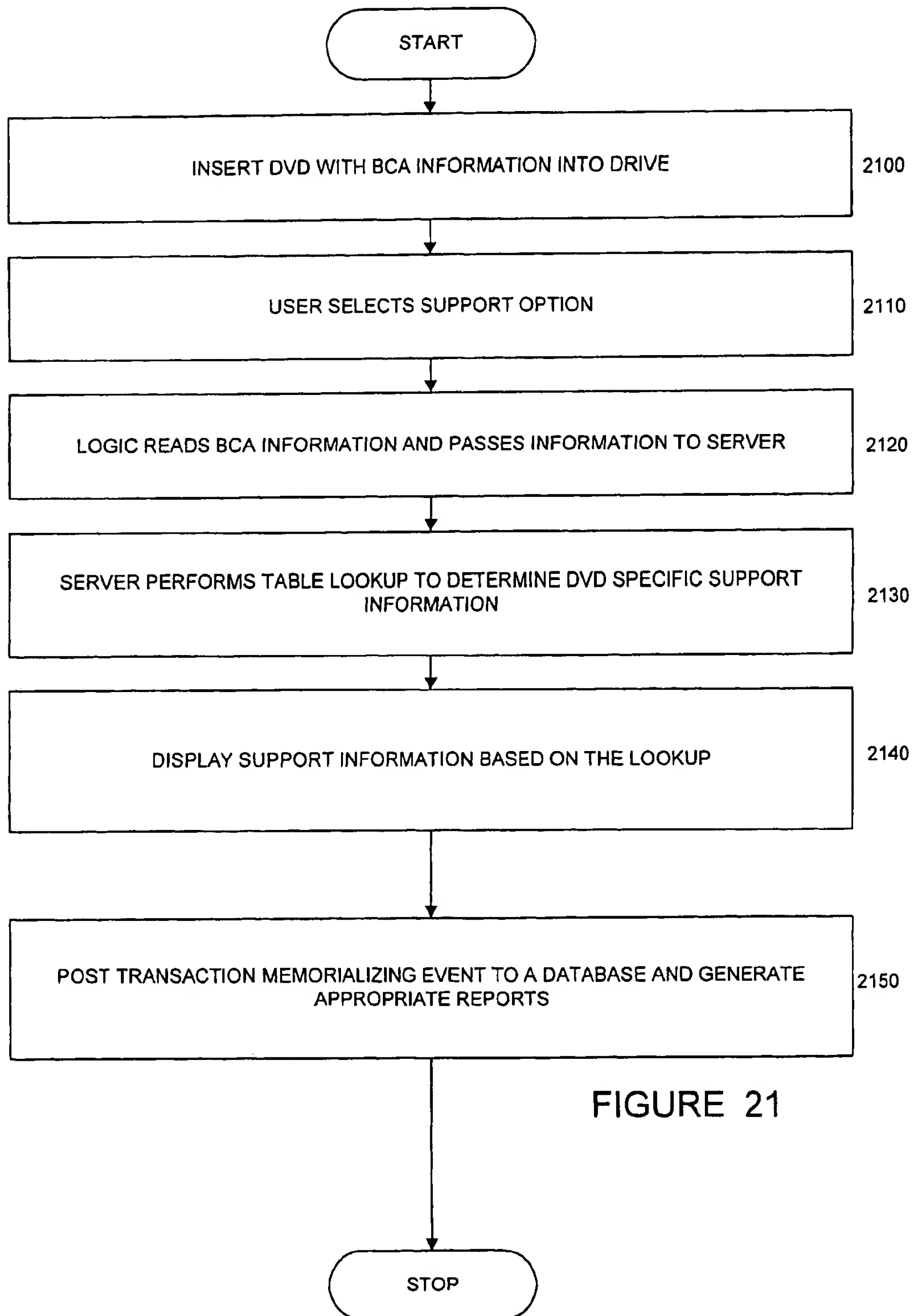


FIGURE 21

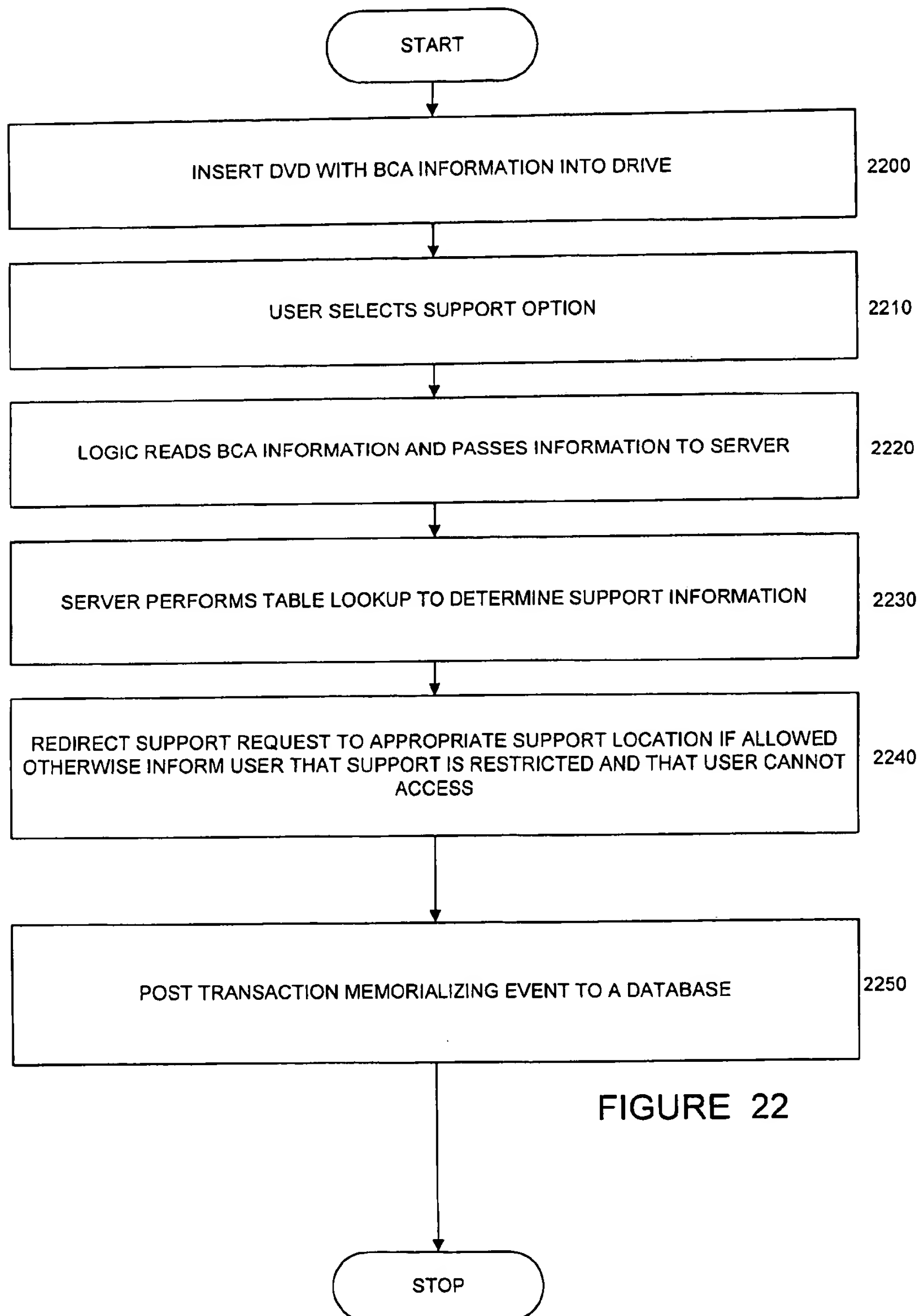


FIGURE 22

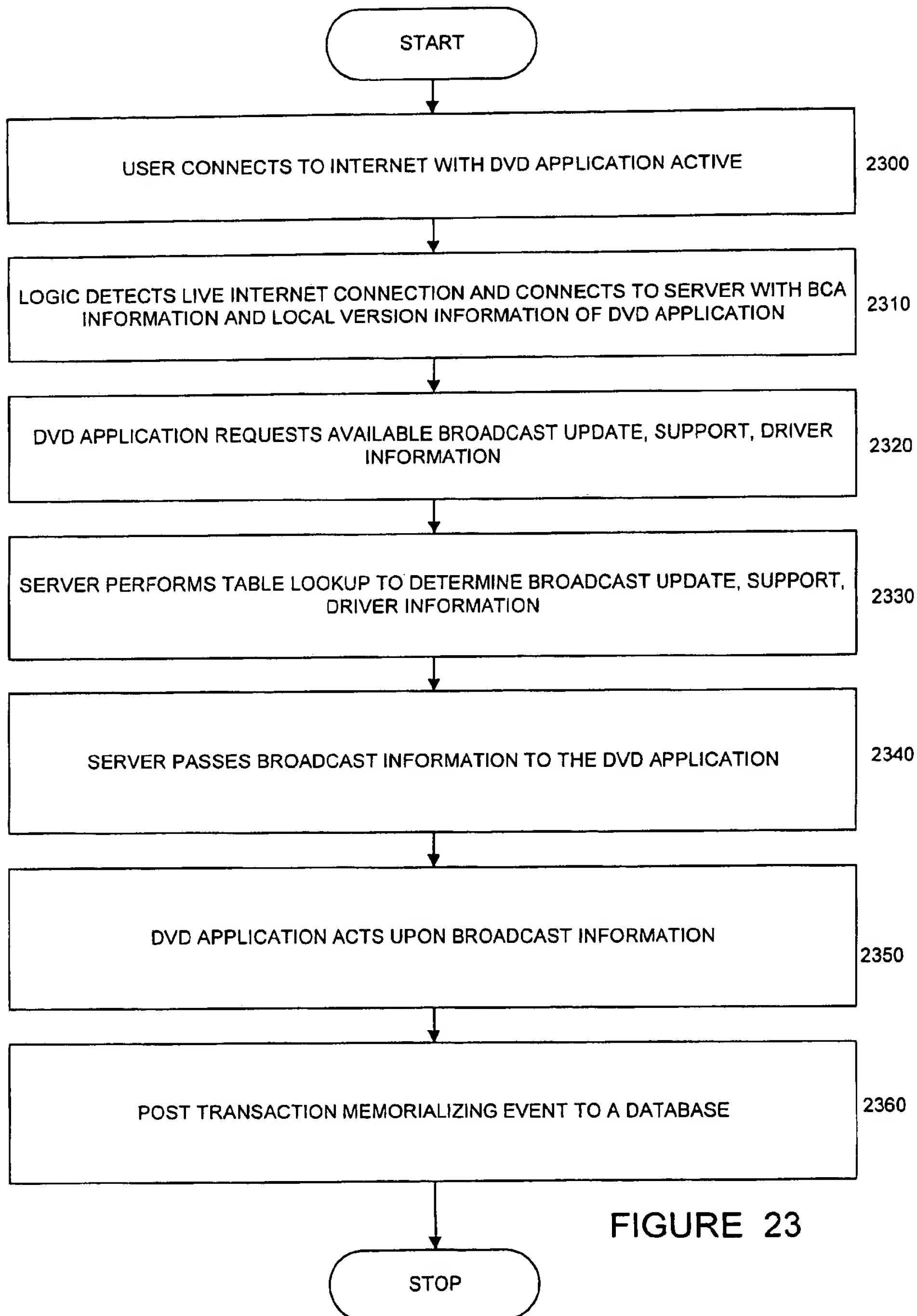


FIGURE 23

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# SYSTEM, METHOD AND ARTICLE OF MANUFACTURE FOR AUTHORIZING THE USE OF ELECTRONIC CONTENT UTILIZING A LASER-CENTRIC MEDIUM

## FIELD OF THE INVENTION

The present invention relates to a distribution and tracking system that utilizes a set of bits on an electronic medium to track and control use of content electronically.

## BACKGROUND OF THE INVENTION

The now familiar compact disk preserves information as a series of microscopic pits and smooth areas, oriented in concentric circular or helical tracks, on the otherwise smooth, planar surface of an annular disk. Recorded information is read from a compact disk by directing a focused laser beam along the recorded tracks, and detecting variations in the intensity of the laser beam as it encounters the microscopic pits and smooth areas on the disk. The coherence and relatively short wavelength of laser radiation enables large volumes of information to be written onto very small spaces of a recording medium.

Compact disks were first introduced in the music recording industry in 1982, and now account for 43% of all recorded music sales. In the United States alone, over three hundred million compact disks are sold annually, with a retail value of over three billion dollars, according to the Recording Industry Association of America. The recording industry has for the last ten years packaged the five inch in diameter prerecorded compact disks in six inch by twelve inch cardboard boxes known in the industry as "long boxes." The long box is easily propped up in display bins alongside traditional vinyl LPs in music store display bins. More importantly, however, the bulk of the long box makes it difficult for a shoplifter to hide a prerecorded compact disk under a coat or in a purse and walk out of a music store without paying. While the long box packaging technique for prerecorded compact disks has been somewhat effective as an anti-theft device, the excess packaging it creates accounts for as much as twenty five million pounds of packaging waste annually.

The Recording Industry Association of America accordingly announced in 1991 its intention to abandon the long box. In February of 1992, the Association announced that, beginning in April 1993, all prerecorded compact disks would be marketed in five inch by five and one half inch packages.

When Compact Discs (CD)s or Digital Video or Versatile Discs (DVD)s are manufactured, they are frequently transported and stored on spindles. This is at least in part due to the fragile nature of the storage medium. Since each disk has a center hole, is relatively thin and is relatively light, storage of multiple discs on a spindle is convenient. Spindles, as used in the manufacture of disks, typically have a central post about two feet long and weighted base about two inches thick. Depending upon the level of automation of the disk manufacturing process, disks may be stored or carried on spindles several times before printing or packaging. In the most fully automated processes, disks are only kept on spindles between the inspection and printing steps and just prior to final packaging. In more manual systems, disks may be placed on spindles between every manufacturing step including between molding and metalizing, between metalizing and spin coating, between spin coating and inspection, between inspection and printing, and between printing and final packaging. However, regardless of the number of times

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the disks are maintained on spindles, each such time the disk is removed for processing, a possibility of theft and confusion as to title exists. In other words, whenever a disk is on a spindle, particularly without any identifying printing, the identification of the title on that spindle may easily be called into question or be confused. It is essential that a capability be built into a disk to track the disk and provide distribution management, quality control and customer access information.

Similarly, whenever disks are maintained on a spindle for any length of time, theft can occur. Without any means of preventing unauthorized removal of disks from the spindle or tracking exactly how many disks were on the spindle, thefts regularly happen.

The merchandising of compact disc (hereinafter "CD") multimedia is a growing industry. CD multimedia are used in audio, video, audio-video, and computer based applications. Since many similar looking duplicate recordings for a particular CD program are often available from many different sources, it is difficult for merchants to track, identify, and distinguish their inventory from the inventory of others.

Security is an important concern associated with the rental, loan, or sale of such merchandise. Items such as commercially prerecorded compact disc programs are available from rental shops, stores, and libraries. It is important for a merchant to have a simple means to secure and identify its merchandise. For example, a merchant needs to determine whether merchandise which was rented from it is the same merchandise that is being returned to it to deter customers from attempting to switch good rented merchandise with bad return merchandise (such as a customer's scratched disc).

The switching of CDs in good condition with defective CDs obtained from other sources is a difficult problem that merchants face. Merchandise switching is a significant problem given the high volume of business involved in the compact disc industry and the difficulty of detecting such illegal switching. An easy and reliable way for a merchant to determine whether the digital data contained on a CD is damaged or defective is required. Although obvious imperfections such as scratches or cracks may be detected by a simple visual inspection, such inspection cannot detect defects in the digital data. Even though defects may be discovered during regular speed playback of an entire CD, such means is commercially impractical since it requires too much time for merchants dealing in high volume to check every CD returned to them. Although high-speed electronic scanning devices for checking digital recordings currently exist, such devices are effectively unavailable to the individual merchant due to cost prohibitions and the limited availability of such technology.

Electronic article surveillance systems for monitoring the egress of sensitive objects from controlled spaces are well known, and have been used alone and along with the long box packaging technique for controlling the unauthorized taking of compact disks. Markers formed from a piece of high permeability magnetic material can be placed on the packaging for the disk. Spaced apart detection panels are then placed across the access points to the store, library or other repository for the monitored compact disks. The panels include field coils and detector coils for producing a magnetic field across the access point that can detect the passage of a marker between the panels. If a person attempts to carry a compact disk through the magnetic field presented by the panels without first deactivating the marker on the disk packaging, the presence of the marker will be detected and an alarm initiated.

U.S. Pat. No. 4,710,754 discloses a multi-directional EAS marker especially designed for its compact dimensions. The marker disclosed in the '754 patent is comprised of a high permeability, low coercive force, generally planar magnetic responder material that includes at least two narrow regions defining switching sections, and adjacent, wider, flux collector sections. The juxtaposition of the narrow switching sections with the flux collector sections causes the flux to be highly concentrated in the switching sections. The high concentration of flux lines in the switching sections produces high frequency harmonics when passed through an alternating magnetic field, allowing the presence of the marker in the field to be detected. The marker is conveniently made dual status, i.e., reversibly deactivatable and reactivatable, by including a piece of magnetizable material adjacent each of the switching sections. The magnetizable material, when magnetized, biases the adjacent switching section to either keep the magnetization therein from reversing when in an alternating interrogation field, or at least altering the response of the marker in the field. In either case, readily distinguishably different signals are produced by the marker in an interrogation field depending on whether the magnetizable material is magnetized or demagnetized.

U.S. Pat. No. 4,967,185 discloses a multi-directional, dual-status EAS marker also designed for its compact dimensions. The marker disclosed in the '185 patent discloses a marker that includes a continuous uninterrupted sheet of remanently magnetizable material overlying a sheet of responder material similar to that disclosed in the '754 patent. The response of the marker within an alternating magnetic field can be discernably altered by selectively magnetizing and demagnetizing the continuous sheet of remanently magnetizable material prior to introducing the marker into the field. The markers disclosed in the above noted prior art can be attached to the packaging for a compact disk. Problems arise, however, when attempting to attach prior art markers directly to the surface of a compact disk. Rotation of the compact disk is required to read information from the disk, and the disk must accordingly be inherently balanced. An EAS marker, applied directly to a compact disk, therefor, would preferably be somehow concentrically mounted on the disk without imbalancing the disk. Prior art EAS markers, however, are not inherently balanced. Moreover, conventional compact disks include a centered aperture that must be maintained clear of obstructions, and the preferred prior art dual status EAS markers include a continuous sheet of magnetic material, such that the marker cannot be concentrically mounted to the surface of a compact disk without obstructing the disk aperture.

U.S. Pat. No. 4,709,813 proposed an anti-theft device for compact disks that overcame the inability to directly apply an EAS marker to the surface of a compact disk. The '813 patent discloses a detachable locking plate with an EAS marker carried on the internal face of the plate that can be selectively locked to the "jewelry box" for a compact disk. The compact disk is physically locked in the box leg by the plate. A clerk or other authorized person can remove the plate with the use of a keyed release tool at the time of payment. It will be appreciated that the use of a locking plate requires preparation time to attach a plate to each compact disk cartridge, adds an additional step in the check-out process, and leaves the compact disk without EAS protection once the EAS marker carrying plate is removed from the compact disk. The lack of EAS protection once the plate is removed makes it especially risky for a retailer to permit the trial playing of a compact disk by a customer in the store

before the compact disk is purchased. The new packaging standard for prerecorded compact disks, while environmentally sound, will exacerbate the problem of compact disk shop lifting, since the smaller packages will be easier to hide and transport out of a store.

While the use of electronic article surveillance systems could partially compensate for the increased shoplifting threat, it will be appreciated that the unauthorized removal of the magnetic markers from a package will defeat the detection capability of the surveillance system, and known EAS markers cannot be directly mounted on a compact disk without affecting the operability of the disk. The use of an EAS marker in conjunction with a locking plate presents handling problems and does not solve the problem of physical security of compact disks at stores where the customer is allowed to listen to the compact disk prior to purchase. A new, compact optical information disk especially designed for tamper-proof use with an electronic article surveillance system through the use of an EAS marker that could be applied directly to the surface of the compact disk would accordingly provide decided advantages. Thus, there is a need for merchants to conveniently and inexpensively maintain the security of their electronic content medium.

#### SUMMARY OF THE INVENTION

A system, method, and article of manufacture is provided for tracking the distribution of content electronically. First, an electronic storage medium tracking identifier is incorporated onto an electronic storage medium and stored on a database. Next, a package tracking identifier is situated onto a package in which the electronic storage medium is stored. The electronic storage medium is then tracked while being shipped between various entities using the tracking identifier on the package. Further, the electronic storage medium may be identified using the tracking identifier on the electronic storage medium in order to afford authorized use of the information contained on the electronic storage medium.

#### DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, aspects and advantages are better understood from the following detailed description of a preferred embodiment of the invention with reference to the drawings, in which:

FIG. 1 is a general block diagram of the method of tracking an electronic medium in accordance with the present invention;

FIG. 2 is a detailed block diagram of the method of tracking the electronic medium in accordance with a preferred embodiment;

FIG. 3 is a block diagram of an embodiment of the hardware involved with one embodiment of the present invention;

FIG. 4 is a pictorial representation of a comparison of the prior lifecycle of electronic storage medium and the electronic storage medium of the present invention;

FIG. 5 is a block diagram of a user experience in accordance with a preferred embodiment;

FIG. 6 is a flowchart of a redirect operation for an electronic commerce transaction in accordance with a preferred embodiment;

FIGS. 7A and 7B are flowcharts setting forth the detailed logic associated with user connection and update for DVD processing in accordance with a preferred embodiment;

FIG. 8 presents logic demonstrating the display of specific advertising information based on a retailer/distributor uti-



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lizing BCA information for intelligent processing in accordance with a preferred embodiment;

FIG. 9 is a flowchart demonstrating the display of specific advertising information based on genre/type of DVD utilizing BCA information for intelligent processing in accordance with a preferred embodiment;

FIG. 10 is a flowchart of a download operation for downloading and updating retailer-specific information of the DVD utilizing BCA information for intelligent processing in accordance with a preferred embodiment;

FIG. 11 is a flowchart of a download operation for downloading and updating DVD title-specific information utilizing BCA information for intelligent processing in accordance with a preferred embodiment;

FIG. 12 is a flowchart of a tailored video viewing operation utilizing BCA information for intelligent processing in accordance with a preferred embodiment;

FIG. 13 is a flowchart of a tailored video viewing operation utilizing BCA information for intelligent processing in accordance with a preferred embodiment;

FIG. 14 is a flowchart of the logic associated with a tailored multimedia viewing operation utilizing BCA information for intelligent processing in accordance with a preferred embodiment;

FIG. 15 is a flowchart of a security operation for restricting access to specific web sites utilizing BCA information for intelligent processing in accordance with a preferred embodiment;

FIG. 16 is a flowchart of a unlock operation for an electronic commerce transaction utilizing BCA information for intelligent processing in accordance with a preferred embodiment;

FIG. 17 is a flowchart of an unlocking operation for an electronic commerce transaction utilizing BCA information for intelligent processing in accordance with a preferred embodiment;

FIG. 18 is a flowchart of a logging operation for tracking piracy and misuse of a DVD utilizing BCA information for intelligent processing in accordance with a preferred embodiment;

FIG. 19 is a flowchart of a redirect operation for a support transaction for intelligent processing in accordance with a preferred embodiment;

FIG. 20 is a flowchart of a display operation for a support transaction for intelligent processing in accordance with a preferred embodiment;

FIG. 21 is a flowchart of support tracking utilizing BCA information for intelligent processing in accordance with a preferred embodiment;

FIG. 22 is a flowchart of a redirect operation for a support transaction for intelligent processing in accordance with a preferred embodiment; and

FIG. 23 is a flowchart of a broadcast operation for downloading update, support and application information utilizing BCA information for intelligent processing in accordance with a preferred embodiment.

#### DETAILED DESCRIPTION

The present invention includes a system, method and article of manufacture for tracking the distribution of content electronically and providing intelligent services based on this information. FIG. 1 is a general block diagram of the method of tracking an electronic medium in accordance with the present invention. Initially, content in the form of music,

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video, data, or any other type of visual or audible entertainment or information is generated in operations 10 and 12. Thereafter, an electronic storage medium tracking identifier, such as the Burst Cut Area (BCA) is incorporated onto an electronic storage medium 22 at the time of manufacture. It should be noted that the electronic storage medium 22 may take the form of any electronic/optic storage medium capable of storing content. In the present description, however, focus will remain on one embodiment of electronic storage medium, a DVD.

As shown in FIG. 1, after the generation of the content, the electronic storage medium may be replicated by a replicator in operation 14. Further, a package tracking identifier is incorporated onto a package in which the electronic storage medium is stored. Such tracking identifiers are then stored in a database.

In use, the electronic storage medium may be tracked from a distributor to a retailer and the consumer in steps 16, 18, and 20. This tracking is enabled by using the tracking identifier on the package 22 while the electronic storage medium is shipped between various entities such as the replicator, distributor, retailer, and consumer. Furthermore, when a final user obtains the electronic storage medium, the electronic storage medium may be identified using the tracking identifier on the electronic storage medium 22. As will become apparent hereinafter, various features may be afforded by identifying the electronic storage medium.

As mentioned earlier, the electronic storage medium may be tracked by using the tracking identifier on the package while the electronic storage medium is shipped between various entities such as a replicator, distributor, retailer, and consumer. Specifically, the replicator is the company that manufactures, or "presses", the DVD. The replicator receives a DLT (digital linear tape) from the content developer (studio such as New Line) and then creates a "glass master" of the DVD based on the data on the DLT. The glass master then becomes the master DVD from which all replicated DVDs are made. The replicator adds the BCA number to each DVD as part of the replication process and then "packages/boxes" the DVDs for distribution to a distributor or retailer.

The distributor, on the other hand, is the company that packages together multiple titles together for distribution to a retailer. The value of a distributor is that they maintain direct relationships and channels with the retailers, can maintain larger inventories of products—leveraging economies of scale not possible by smaller retailers. A retailer requests multiple products from the distributor (for example 20 copies of *Lost in Space*, 50 copies of *Ronin*, and 100 copies of *You've Got Mail*—all of which come from different studios), then the distributor can "package" the variety of products together for distribution to the retailer.

Finally, the retailer is the company that sells product directly to consumer. Examples include "brick-and-mortar" stores such as Blockbuster Video, Hollywood Video, Best Buy, Good Guys, etc. Retailers also include online retailers such as DVDEExpress, Amazon.com, and other e-commerce-oriented companies. Other groups are also joining the retailing opportunity, such as Nimbus who already offers both replication and distribution. It is the next logical step to offer direct-to-consumer online sales of product. It should be noted that the aforementioned replicator may also be the distributor (Nimbus/Technicolor, WAMO/Deluxe). Also, replicators may ship directly to retailers, especially in the case of large accounts like Blockbuster.

#### Example in Accordance with a Preferred Embodiment

An example setting forth details relating to the tracking of DVDs will now be set forth. First, a content owner (such as

studio) requests use of the BCA on their DVDs. Based on request, the replicator (examples include WAMO, Panasonic, Nimbus, Technicolor, Pioneer, Crest) adds unique BCA number to every DVD. Adding BCA number to each DVD requires a special (YAG) laser. This may be the very last step in the manufacturing process. The BCA numbers for a specific DVD must then be entered into InterActual's BCA database. Information to track includes: DVD title, i.e. "Lost in Space"; BCA #/range, i.e. 12345687890; and Shipping Packaging/Tracking Container, i.e. Box 52221 to Hollywood Video.

After the BCA number is added to the DVDs, the DVDs are packaging/boxed for distribution to either the Distributor or the Retailer. It should be noted that many companies take multiple forms, so the replicator and distributor may be one in the same. Also, some retailers are large/important enough to get shipments directly from replicator. The way in which the DVDs are packaging/shipped is very important because one must track the BCA numbers to actual shipping containers (box, etc.). Therefore tracking information must also be added to the BCA database.

If packaged DVDs are then sent to distributor, the distributor also has mechanisms, i.e. scanners, input device, and monitoring devices, in place for tracking based on their distribution. For example, Deluxe may receive a "package" of 100,000 copies of "Lost in Space". However, the distributor ships 10,000 to Retailer A and 5,000 to Retailer B. The distributor should be able to "input" retailer A and B's distribution information into the system. Ideally, this becomes a seamless/automated process.

Once the DVDs reach the retailer (either from the replicator or distributor), then DVDs may be further divided and distributed to local stores/outlets. In such a situation, the retailer should be able to automatically "track" distribution of these DVDs through to their stores. Over time, all three entities (replicator, distributor, and retailer) are able to add tracking information to BCA database. Due to complexity and dependencies on existing business systems, the retail tracking concept will be rolled out in phases: replicator first most likely with key retail accounts. The distributors will be brought in. Retailers will then begin to embrace the ability to track based on local outlet/store.

#### Utilization of BCA Identification at the End Consumer

As mentioned earlier, when a final user obtains the electronic storage medium, the electronic storage medium may be identified using the tracking identifier on the electronic storage medium. By this identification, various features may be executed upon identification of the electronic storage medium. It should be noted that, in one embodiment, identification is carried out by a computer and software governs the features that are executed after identification of the electronic storage medium.

For example, the present invention may be practiced in the context of a personal computer such as an IBM compatible personal computer, Apple Macintosh computer or UNIX based workstation. A representative hardware environment is depicted in FIG. 3, which illustrates a typical hardware configuration of a workstation in accordance with a preferred embodiment having a central processing unit 110, such as a microprocessor, and a number of other units interconnected via a system bus 112. The workstation shown in FIG. 3 includes a Random Access Memory (RAM) 114, Read Only Memory (ROM) 116, an I/O adapter 118 for connecting peripheral devices such as disk storage units 120

to the bus 112, a user interface adapter 122 for connecting a keyboard 124, a mouse 126, a speaker 128, a microphone 132, and/or other user interface devices such as a touch screen (not shown) to the bus 112, communication adapter 134 for connecting the workstation to a communication network (e.g., a data processing network) and a display adapter 136 for connecting the bus 112 to a display device 138. The workstation typically has resident thereon an operating system such as the Microsoft Windows NT or Windows/95 Operating System (OS), the IBM OS/2 operating system, the MAC OS, or UNIX operating system. Those skilled in the art will appreciate that the present invention may also be implemented on platforms and operating systems other than those mentioned.

A preferred embodiment is written using JAVA, C, and the C++ language and utilizes object oriented programming methodology. Object oriented programming (OOP) has become increasingly used to develop complex applications. As OOP moves toward the mainstream of software design and development, various software solutions require adaptation to make use of the benefits of OOP. A need exists for these principles of OOP to be applied to a messaging interface of an electronic messaging system such that a set of OOP classes and objects for the messaging interface can be provided.

OOP is a process of developing computer software using objects, including the steps of analyzing the problem, designing the system, and constructing the program. An object is a software package that contains both data and a collection of related structures and procedures. Since it contains both data and a collection of structures and procedures, it can be visualized as a self-sufficient component that does not require other additional structures, procedures or data to perform its specific task. OOP, therefore, views a computer program as a collection of largely autonomous components, called objects, each of which is responsible for a specific task. This concept of packaging data, structures, and procedures together in one component or module is called encapsulation.

In general, OOP components are reusable software modules which present an interface that conforms to an object model and which are accessed at run-time through a component integration architecture. A component integration architecture is a set of architecture mechanisms which allow software modules in different process spaces to utilize each others capabilities or functions. This is generally done by assuming a common component object model on which to build the architecture. It is worthwhile to differentiate between an object and a class of objects at this point. An object is a single instance of the class of objects, which is often just called a class. A class of objects can be viewed as a blueprint, from which many objects can be formed.

OOP allows the programmer to create an object that is a part of another object. For example, the object representing a piston engine is said to have a composition-relationship with the object representing a piston. In reality, a piston engine comprises a piston, valves and many other components; the fact that a piston is an element of a piston engine can be logically and semantically represented in OOP by two objects.

OOP also allows creation of an object that "depends from" another object. If there are two objects, one representing a piston engine and the other representing a piston engine wherein the piston is made of ceramic, then the relationship between the two objects is not that of composition. A ceramic piston engine does not make up a piston

engine. Rather it is merely one kind of piston engine that has one more limitation than the piston engine; its piston is made of ceramic. In this case, the object representing the ceramic piston engine is called a derived object, and it inherits all of the aspects of the object representing the piston engine and adds further limitation or detail to it. The object representing the ceramic piston engine "depends from" the object representing the piston engine. The relationship between these objects is called inheritance.

When the object or class representing the ceramic piston engine inherits all of the aspects of the objects representing the piston engine, it inherits the thermal characteristics of a standard piston defined in the piston engine class. However, the ceramic piston engine object overrides these ceramic specific thermal characteristics, which are typically different from those associated with a metal piston. It skips over the original and uses new functions related to ceramic pistons. Different kinds of piston engines have different characteristics, but may have the same underlying functions associated with it (e.g., how many pistons in the engine, ignition sequences, lubrication, etc.). To access each of these functions in any piston engine object, a programmer would call the same functions with the same names, but each type of piston engine may have different/overriding implementations of functions behind the same name. This ability to hide different implementations of a function behind the same name is called polymorphism and it greatly simplifies communication among objects.

With the concepts of composition-relationship, encapsulation, inheritance and polymorphism, an object can represent just about anything in the real world. In fact, our logical perception of the reality is the only limit on determining the kinds of things that can become objects in object-oriented software. Some typical categories are as follows:

Objects can represent physical objects, such as automobiles in a traffic-flow simulation, electrical components in a circuit-design program, countries in an economics model, or aircraft in an air-traffic-control system.

Objects can represent elements of the computer-user environment such as windows, menus or graphics objects.

An object can represent an inventory, such as a personnel file or a table of the latitudes and longitudes of cities.

An object can represent user-defined data types such as time, angles, and complex numbers, or points on the plane.

With this enormous capability of an object to represent just about any logically separable matters, OOP allows the software developer to design and implement a computer program that is a model of some aspects of reality, whether that reality is a physical entity, a process, a system, or a composition of matter. Since the object can represent anything, the software developer can create an object which can be used as a component in a larger software project in the future.

If 90% of a new OOP software program consists of proven, existing components made from preexisting reusable objects, then only the remaining 10% of the new software project has to be written and tested from scratch. Since 90% already came from an inventory of extensively tested reusable objects, the potential domain from which an error could originate is 10% of the program. As a result, OOP enables software developers to build objects out of other, previously built objects.

This process closely resembles complex machinery being built out of assemblies and sub-assemblies. OOP

technology, therefore, makes software engineering more like hardware engineering in that software is built from existing components, which are available to the developer as objects. All this adds up to an improved quality of the software as well as an increased speed of its development.

Programming languages are beginning to fully support the OOP principles, such as encapsulation, inheritance, polymorphism, and composition-relationship. With the advent of the C++ language, many commercial software developers have embraced OOP. C++ is an OOP language that offers a fast, machine-executable code. Furthermore, C++ is suitable for both commercial-application and systems-programming projects. For now, C++ appears to be the most popular choice among many OOP programmers, but there is a host of other OOP languages, such as Smalltalk, Common Lisp Object System (CLOS), and Eiffel. Additionally, OOP capabilities are being added to more traditional popular computer programming languages such as Pascal.

The benefits of object classes can be summarized, as follows:

Objects and their corresponding classes break down complex programming problems into many smaller, simpler problems.

Encapsulation enforces data abstraction through the organization of data into small, independent objects that can communicate with each other. Encapsulation protects the data in an object from accidental damage, but allows other objects to interact with that data by calling the object's member functions and structures.

Subclassing and inheritance make it possible to extend and modify objects through deriving new kinds of objects from the standard classes available in the system. Thus, new capabilities are created without having to start from scratch.

Polymorphism and multiple inheritance make it possible for different programmers to mix and match characteristics of many different classes and create specialized objects that can still work with related objects in predictable ways.

Class hierarchies and containment hierarchies provide a flexible mechanism for modeling real-world objects and the relationships among them.

Libraries of reusable classes are useful in many situations, but they also have some limitations. For example:

Complexity. In a complex system, the class hierarchies for related classes can become extremely confusing, with many dozens or even hundreds of classes.

Flow of control. A program written with the aid of class libraries is still responsible for the flow of control (i.e., it must control the interactions among all the objects created from a particular library). The programmer has to decide which functions to call at what times for which kinds of objects.

Duplication of effort. Although class libraries allow programmers to use and reuse many small pieces of code, each programmer puts those pieces together in a different way. Two different programmers can use the same set of class libraries to write two programs that do exactly the same thing but whose internal structure (i.e., design) may be quite different, depending on hundreds of small decisions each programmer makes along the way. Inevitably, similar pieces of code end up doing similar things in slightly different ways and do not work as well together as they should.

Class libraries are very flexible. As programs grow more complex, more programmers are forced to reinvent basic



solutions to basic problems over and over again. A relatively new extension of the class library concept is to have a framework of class libraries. This framework is more complex and consists of significant collections of collaborating classes that capture both the small scale patterns and major mechanisms that implement the common requirements and design in a specific application domain. They were first developed to free application programmers from the chores involved in displaying menus, windows, dialog boxes, and other standard user interface elements for personal computers.

Frameworks also represent a change in the way programmers think about the interaction between the code they write and code written by others. In the early days of procedural programming, the programmer called libraries provided by the operating system to perform certain tasks, but basically the program executed down the page from start to finish, and the programmer was solely responsible for the flow of control. This was appropriate for printing out paychecks, calculating a mathematical table, or solving other problems with a program that executed in just one way.

The development of graphical user interfaces began to turn this procedural programming arrangement inside out. These interfaces allow the user, rather than program logic, to drive the program and decide when certain actions should be performed. Today, most personal computer software accomplishes this by means of an event loop which monitors the mouse, keyboard, and other sources of external events and calls the appropriate parts of the programmer's code according to actions that the user performs. The programmer no longer determines the order in which events occur. Instead, a program is divided into separate pieces that are called at unpredictable times and in an unpredictable order. By relinquishing control in this way to users, the developer creates a program that is much easier to use. Nevertheless, individual pieces of the program written by the developer still call libraries provided by the operating system to accomplish certain tasks, and the programmer must still determine the flow of control within each piece after it's called by the event loop. Application code still "sits on top of" the system.

Even event loop programs require programmers to write a lot of code that should not need to be written separately for every application. The concept of an application framework carries the event loop concept further. Instead of dealing with all the nuts and bolts of constructing basic menus, windows, and dialog boxes and then making these things all work together, programmers using application frameworks start with working application code and basic user interface elements in place. Subsequently, they build from there by replacing some of the generic capabilities of the framework with the specific capabilities of the intended application.

Application frameworks reduce the total amount of code that a programmer has to write from scratch. However, because the framework is really a generic application that displays windows, supports copy and paste, and so on, the programmer can also relinquish control to a greater degree than event loop programs permit. The framework code takes care of almost all event handling and flow of control, and the programmer's code is called only when the framework needs it (e.g., to create or manipulate a proprietary data structure).

A programmer writing a framework program not only relinquishes control to the user (as is also true for event loop programs), but also relinquishes the detailed flow of control within the program to the framework. This approach allows the creation of more complex systems that work together in interesting ways, as opposed to isolated programs, having custom code, being created over and over again for similar problems.

Thus, as is explained above, a framework basically is a collection of cooperating classes that make up a reusable design solution for a given problem domain. It typically includes objects that provide default behavior (e.g., for menus and windows), and programmers use it by inheriting some of that default behavior and overriding other behavior so that the framework calls application code at the appropriate times.

There are three main differences between frameworks and class libraries:

**Behavior versus protocol.** Class libraries are essentially collections of behaviors that you can call when you want those individual behaviors in your program. A framework, on the other hand, provides not only behavior but also the protocol or set of rules that govern the ways in which behaviors can be combined, including rules for what a programmer is supposed to provide versus what the framework provides.

**Call versus override.** With a class library, the code the programmer instantiates objects and calls their member functions. It's possible to instantiate and call objects in the same way with a framework (i.e., to treat the framework as a class library), but to take full advantage of a framework's reusable design, a programmer typically writes code that overrides and is called by the framework. The framework manages the flow of control among its objects. Writing a program involves dividing responsibilities among the various pieces of software that are called by the framework rather than specifying how the different pieces should work together.

**Implementation versus design.** With class libraries, programmers reuse only implementations, whereas with frameworks, they reuse design. A framework embodies the way a family of related programs or pieces of software work. It represents a generic design solution that can be adapted to a variety of specific problems in a given domain. For example, a single framework can embody the way a user interface works, even though two different user interfaces created with the same framework might solve quite different interface problems.

Thus, through the development of frameworks for solutions to various problems and programming tasks, significant reductions in the design and development effort for software can be achieved. A preferred embodiment of the invention utilizes HyperText Markup Language (HTML) to implement documents on the Internet together with a general-purpose secure communication protocol for a transport medium between the client and the Newco. HTTP or other protocols could be readily substituted for HTML without undue experimentation. Information on these products is available in T. Berners-Lee, D. Connolly, "RFC 1866: Hypertext Markup Language—2.0" (November 1995); and R. Fielding, H. Frystyk, T. Berners-Lee, J. Gettys and J. C. Mogul, "Hypertext Transfer Protocol—HTTP/1.1: HTTP Working Group Internet Draft" (May 2, 1996). HTML is a simple data format used to create hypertext documents that are portable from one platform to another. HTML documents are SGML documents with generic semantics that are appropriate for representing information from a wide range of domains. HTML has been in use by the WorldWide Web global information initiative since 1990. HTML is an application of ISO Standard 8879; 1986 Information Processing Text and Office Systems—Standard Generalized Markup Language (SGML).

To date, Web development tools have been limited in their ability to create dynamic Web applications that span from

client to server and interoperate with existing computing resources. Until recently, HTML has been the dominant technology used in development of Web-based solutions. However, HTML has proven to be inadequate in the following areas:

- Poor performance;
- Restricted user interface capabilities;
- Can only produce static Web pages;
- Lack of interoperability with existing applications and data; and
- Inability to scale.

Sun Microsystem's Java language solves many of the client-side problems by:

- Improving performance on the client side;
- Enabling the creation of dynamic, real-time Web applications; and
- Providing the ability to create a wide variety of user interface components.

With Java, developers can create robust User Interface (UI) components. Custom "widgets" (e.g., real-time stock tickers, animated icons, etc.) can be created, and client-side performance is improved. Unlike HTML, Java supports the notion of client-side validation, offloading appropriate processing onto the client for improved performance. Dynamic, real-time Web pages can be created. Using the above-mentioned custom UI components, dynamic Web pages can also be created.

Sun's Java language has emerged as an industry-recognized language for "programming the Internet." Sun defines Java as: "a simple, object-oriented, distributed, interpreted, robust, secure, architecture-neutral, portable, high-performance, multithreaded, dynamic, buzzword-compliant, general-purpose programming language. Java supports programming for the Internet in the form of platform-independent Java applets." Java applets are small, specialized applications that comply with Sun's Java Application Programming Interface (API) allowing developers to add "interactive content" to Web documents (e.g., simple animations, page adornments, basic games, etc.). Applets execute within a Java-compatible browser (e.g., Netscape Navigator) by copying code from the server to client. From a language standpoint, Java's core feature set is based on C++. Sun's Java literature states that Java is basically, "C++ with extensions from Objective C for more dynamic method resolution."

Another technology that provides similar function to JAVA is provided by Microsoft and ActiveX Technologies, to give developers and Web designers wherewithal to build dynamic content for the Internet and personal computers. ActiveX includes tools for developing animation, 3-D virtual reality, video and other multimedia content. The tools use Internet standards, work on multiple platforms, and are being supported by over 100 companies. The group's building blocks are called ActiveX Controls, small, fast components that enable developers to embed parts of software in hypertext markup language (HTML) pages. ActiveX Controls work with a variety of programming languages including Microsoft Visual C++, Borland Delphi, Microsoft Visual Basic programming system and, in the future, Microsoft's development tool for Java, code named "Jakarta." ActiveX Technologies also includes ActiveX Server Framework, allowing developers to create server applications. One of ordinary skill in the art readily recognizes that ActiveX could be substituted for JAVA without undue experimentation to practice the invention.

#### System Software in Accordance With a Preferred Embodiment

When a consumer purchases DVD at local store, or purchases online through online retailer a new DVD is

available for consumer use. The consumer places the DVD in a computer and the DVD initiates an online session between the user and an Internet server application in tight communication with the DVD in the DVD-ROM drive.

Three BCA usage cases include:

- (1) a consumer launches a browser and goes to a web site that utilizes the BCA information to look up information in a database. The database is also updated with information gleaned from the current user and their demographics.
- (2) a local application (like PCFriendly) automatically connects to Internet and to a web server that looks up and/or acts on BCA information, or
- (3) a local application like PCFriendly utilizes information already contained in the BCA number and tailors experience locally based on this information.

The details associated with the various cases will be discussed. Case 1: go to web site that looks up BCA. With a DVD in their drive, consumer connects to a special web site that has an agent/component embedded on the web page that can read the BCA information. This embedded component reads the BCA, along with other potential information (user id, etc.), passes this information to the web server. The web server then tailors a response to the consumer based on pre-defined conditions/marketing/profile.

Case 2: local application (like PCFriendly client software) automatically connects to a web server (without manual intervention of consumer) and passes BCA information to the web server. Based on the BCA number and other potential information, the web server passes information to the consumer's client software or presents remote Internet-based information based on this information/profile/retailer/etc.

Case 3: location application (like PCFriendly) reads BCA information and acts upon predefined information in the BCA number itself. This case does not necessarily require an Internet connection. The BCA is obtained utilizing ASPI code to read the 188 bytes of information.

Examples of Cases:

Case 1: ActiveX control is designed using C++ and embedded in HTML page (using standard OBJECT definition in HTML). When the web page is loaded, so is the ActiveX control. Upon a grant of permission by a consumer, the ActiveX control accesses the DVD-ROM drive, obtains BCA data, and any other pertinent information. The ActiveX control then "posts" this information to the web server using HTTP or FTP POST methods. The web server automatically reads and parses the POST information, and acts upon this information (for example, by sending the consumer to a unique URL that is only accessible if the correct DVD with the correct BCA is in the DVD-ROM drive).

Case 2: Local C++ application (PCFriendly) utilizes a remote agent technology developed by InterActual. The remote agent technology automatically connects to the remote web server (without consumer interaction) and passes the web server the BCA number with any other pertinent information. The remote agent also supports HTTP or FTP POST methods. The web server automatically reads and parses the POST information, and acts upon this information.

Examples Include:

Consumer request to purchase a specific product is automatically routed to the retailer from which the original DVD was purchased. In support of this example, a virtual POP/MDF display and information is downloaded (or unlocked) locally and presented to consumer.

Case 3: Local C++ application or activeX controls in a local web page access the BCA information on the DVD.

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Based on this information, the local application acts upon this information. (In this mode, the information contains in the BCA field must have sufficient information for local application to act upon).

The current system involves an online database that provides a real-time lookup based on the BCA. The resulting lookup in the database can retrieve information specific to the application such as a consumer profile, retailer and support location and piracy information.

#### USAGES OF BCA INFORMATION

##### Retail Distribution

When a remote agent connects to a server with BCA information, the server performs a real-time lookup on the BCA number and determines the replicator, distributor, and/or retailer for the passed BCA number. This information can then be used for various projects, such as Updating or changing channel/banner/programming in PCFriendly software. FIG. 2 depicts this operation as a RemoteSync 238. Unlock specific assets such as HTML, video, graphics and others which are depicted in function block Unlock Server 230. Play different assets or portion of video based on BCA information as shown in function block Unlock Server 230. The application also downloads new content based on the BCA information RemoteSync 238.

The BCA information can also be utilized to direct e-commerce transactions or "buy-me" buttons to an appropriate retailer utilizing the RemoteTrak/BCATrak function 234.

An application in accordance with a preferred embodiment can also broadcast new information/updates as shown in the Broadcast Server function block 236. Logic is also provided to unlock and/or control access to specific web sites based on BCA information as shown in the RemoteTrak Server function block 230. This logic provides consumer redirect to specific "storefront" of a retailer.

##### Track Individual Retail Store Performance

Specific retail store performance and consumer online usage associated with specific retailers can be tracked utilizing information based on the BCA number. This provides a local retailer with information to determine the most successful opportunities to get users online. Information such as a virtual Point of Purchase (POP) and Marketing Development Fund (MDF) utilize the BCA information and the RemoteTrak Server function 230 to track and attract consumers.

Discount coupons and the like (e.g., "cents off" coupons, rebate coupons, special offer coupons, or the like, collectively referred to herein as "coupons") have become an integral part of marketing strategies for many products, particularly retail consumer goods, sundries, foodstuffs, hardware, clothing, and the like, typically sold at local grocery, drug, and discount stores. Product manufacturers have come to rely upon coupons, rebate and gift certificates or the like to promote new and existing products, boost sales, and obtain demographic information concerning consumer buying patterns. Consumers have come to rely upon coupons or certificates as a technique for reducing costs.

Prior art couponing techniques have had several disadvantages, not the least of which are low response rate and fraud. In the prior art, coupons may be distributed using direct mailing techniques, printed in newspapers, magazines, or the like, distributed with other commercial goods (e.g., laundry soap coupon packaged with washing machine), or distributed (e.g., by original equipment manufacturers or OEMs) with the same or like goods, computers

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or the like (e.g., "cents off toward next purchase). Such techniques require massive amounts of printing and distribution, and historically have a low response rate (e.g., typically less than 2% of coupons distributed are redeemed). Thus, such mass-distribution techniques may not be cost effective, and are not environmentally friendly, due to the large amount of paper wasted.

Such low response rates may be due in part to the difficulty a consumer may have in maintaining, cataloging, and finding appropriate coupons before shopping. A particular consumer may have at his or her disposal only those coupons that have been sent to him or her and have been retained by the consumer. Moreover, since many coupons have expiration dates, a consumer may have to carefully catalog each coupon to insure that it is redeemed before such an expiration date occurs. Such techniques are time-consuming and cumbersome. Generally, only those consumers on a budget or those who use couponing as a hobby have sufficient time to maximize their use of available coupons. Busier and more affluent consumers may not believe that such coupon management techniques are cost effective. This latter group of consumers may represent a more desirable demographic for a product manufacturer to attract or track.

With the advent of double or even triple redemption couponing promotions provided by some retail stores (e.g., grocery store chain or the like) as well as generous cash rebate coupon promotions (i.e., gift certificates or the like), fraud had become an every increasing problem in coupon marketing. Color photocopiers may create coupons that are indistinguishable from originals. Unscrupulous consumers may use such copied coupons to purchase large numbers of items at reduced prices or fraudulently obtain rebates for products which were never purchased.

Moreover, some unscrupulous retailer may conspire with coupon brokers to redeem large numbers of illicitly obtained or generated to defraud manufacturers.

As coupon discounts or rebates may be used for promotional purposes, the resulting net price to the consumer with such a discount may be less than the product manufacturer's wholesale price. A product manufacturer may offer such steep discounts in the hope of obtaining future sales at full retail prices. If a consumer uses a photocopied coupon for multiple purchases of a retail item, the product manufacturer may not obtain the desired repeat sales at full retail price, and the entire scheme of couponing may be defeated.

In addition, prior art couponing techniques have yielded little, if any, useful data to product manufacturers regarding who is redeeming such coupons. Consumer demographic data is invaluable to a product manufacturer in determining which products to target to particular consumer groups (e.g., through particular advertising venues). Moreover, such demographic data may be used to more efficiently distribute future coupons. In addition, information as to the buying habits (i.e., recency, frequency, and monetary value or RFM) and demographics of particular consumers or groups of consumers have a market value and such information may be sold or traded for a profit.

Various techniques have been tried to eliminate or reduce fraud, provide more convenient techniques for distributing coupons, and to better track consumer demographic data. De Lapa et al., U.S. Pat. No. 5,353,218 discloses a focused coupon system. FIG. 6 of De Lapa et al. is most illustrative. De Lapa et al. discloses a system for distributing coupons with a machine readable code (barcode) containing both customer and coupon identifications. The consumer code may be replaced with a generic code used in a look-up table



for coupon verification and information. The entire machine-readable code may be captured and uploaded to a central database for determining coupon and consumer identification. The uploaded information may be used for marketing purposes (to determine which coupons to next send to the consumer) and/or for rebate purposes.

Although the system of De Lapa et al. attempts to provide a more focused distribution technique, the system still relies upon paper coupons being distributed to consumers. Consumers may throw out such mass mailings (i.e., "junk mail") without opening them. Moreover, the system relies upon the consumer supplying demographic information in a questionnaire or the like in order to be provided with the coupons. Moreover, since the coupons of De Lapa et al. are preprinted, coupon trading or copying may be more prevalent.

Furthermore, in De Lapa et al., no mechanism is present for capturing subsequent demographic information. In addition, as consumer data is captured at the store level, an additional mechanism may be required to upload such consumer information to a centralized database to capture consumer demographic information. Additional data processing hardware/software may be required at a retail store in order to process such data. Thus, retailers may be initially reluctant to invest in such a scheme.

In retailing, it may be essential to check out consumers in as little time as possible. Thus, if additional processing time is required during customer checkout to process the coupons of De Lapa et al. retailers may be less likely to accept adopt such technologies.

Moreover, under the scheme of De Lapa et al., there is no mechanism provided to insure that the individual who receives the coupons is the targeted individual. If a consumer moves to a new address, new occupants at the old address may receive and redeem coupons addressed to the consumer. Thus, target tracking data may be inaccurate or incomplete.

Murphy, U.S. Pat. No. 5,305,195, issued Apr. 19, 1994, discloses an interactive advertising system for on-line terminals. A series of remote terminals receive compressed and encoded video advertising signals that may be stored on an internal hard drive. The advertising videos are played, and a consumer may select products using the terminal. In FIG. 4, (Col. 7, lines 45-50) Murphy discloses that a printer may be provided for printing selected coupons.

The apparatus of Murphy may solve some of the problems associated with distributing coupons in paper form. However, The Murphy system appears to be more concerned with directing advertising information than collecting demographic information or distributing coupons. Thus, it does not appear that the apparatus of Murphy is equipped to process demographic information or reduce coupon fraud. Moreover, Murphy discloses his apparatus for use in college campuses, a limited and narrow consumer demographic.

Von Kohorn, U.S. Pat. No. 5,128,752, issued Jul. 7, 1992 discloses a system and method for generating and redeeming tokens selected from television data. Product information and authentication data may be transmitted and displayed on a television and a home printer. A viewer may select a coupon for printing and redeem the coupon at a retail store. Von Kohorn does disclose a technique for reducing fraud (Col. 7, lines 16-38). However, it appears that these techniques require action at the retail level to verify that a coupon is indeed legitimate, including, in one embodiment, requesting identification credentials from the consumer. Such techniques may be intrusive and cumbersome to use in

a retail establishment where a number of coupons may be redeemed at any given time.

Moreover, it does not appear in the system of Von Kohorn, which relies on broadcasting, does not target specific consumers with particular coupons. Rather, it appears that the coupons are distributed to all viewers equipped with the appropriate apparatus. Note that in FIG. 6 (Col. 9, lines 40-48) Von Kohorn discloses a technique for recording marketing data from consumer information encoded into the coupon.

Axler et al., U.S. Pat. No. 5,305,197, issued Apr. 19, 1994, discloses a coupon-dispensing machine with feedback. A consumer kiosk is placed in a retail establishment or the like to display advertising (LED scroll) and allow customers to print out selected coupons. A proximity sensor detects the presence of customers near the apparatus.

The Axler device may solve some of the problems associated with paper distribution of coupons. However, it does not appear that the Axler device may retrieve any significant amount of consumer demographic data other than the number and type of coupons printed. Moreover, within the in-store environment, it may be difficult to enter such consumer data, particularly with the keypad disclosed by Axler. Thus, it does not appear that the Axler device may be suitably adapted to retrieve consumer demographic data.

A fundamental fault with the Axler device is that it does not appear to target or prior motivates customers with to visit a retailer with specific coupons. Rather, the in-store location of the Axler device may facilitate a consumer "targeting" a coupon. In other words, a consumer may make a number of product selections in a store and then visit the coupon kiosk of Axler to determine whether any purchases are subject to coupon discount or rebate. Thus, the fundamental goal of couponing--to motivate a consumer to purchase a product--may be compromised.

In addition, the kiosk of Axler may occupy valuable commercial retail space. In a retail store (e.g., supermarket or the like) even a few feet of shelving may be extremely valuable for displaying and containing retail merchandise. Product manufacturers may even pay "rent" to a retail establishment in the form of rebates or promotional fees in order to obtain prominent shelf space. Thus, a retail establishment may be loath to give up such valuable space to a couponing kiosk. Moreover, it may be time consuming and frustrating for customers waiting in line to access the kiosk. Providing additional kiosks may be cost-prohibitive.

#### Support Services in Accordance with a Preferred Embodiment

To provide enhanced support for DVD in a commercial environment, the BCA is utilized to redirect to a specific support site based on table lookup utilizing the BCA number as shown in FIG. 2 at function block 234 RemoteTrak/BCATrak Server function block. Logic is also provided to track disc anomalies and defects from manufacturing process as shown in function block 234 RemoteTrak/BCATrak Server. Other logic is also provided to track retailer-specific support issues as shown in function block 234 RemoteTrak/BCATrak Server, to track geographical support issues as shown in function block 234 RemoteTrak/BCATrak Server, to restrict access to support sites based on BCA information as shown in function block RemoteTrak/BCATrak Server 234. Finally, enhanced support is provided for broadcast updates utilizing support and drivers based on BCA information as shown at function block 236 Broadcast Server.

#### Security in Accordance with a Preferred Embodiment

The BCA information can also be combined with game unlocking logic to provide an authorized user with unlocked

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video based on BCA information as shown at function block 238 DVDUnlock Server. BCA information has a unique identifier which, when combined with other data, can track when a movie and/or a game was given to a friend which will trigger another transaction for payment or other information as shown in function block 234 RemoteTrak/BCATrak Server. This information can also be used to track pirated DVDs, and report the information back to the retailer as shown in function block 230

RemoteTrak/BCATrak Server, back to a manufacturer as shown in function block 230 RemoteTrak/BCATrak Server and back to a distributor as shown in function block 230 RemoteTrak/BCATrak Server.

This capability provides the ability to localize pirated discs to a specific region/retailer as shown in function block 230 RemoteTrak/BCATrak Server and track illegal region code use and potentially trace back to retailer/distributor as shown in function block 230 RemoteTrak/BCATrak Server.

#### General/Advertising Logic in Accordance with a Preferred Embodiment

Logic is also provided to tailor video based information as part of the BCA (play video 1 for one demographic, play video 2 for another as shown in function block 238 DVDUnlock Server, RemoteSync, and to tailor internet/browser experience based on BCA information as shown in function block 238 RemoteTrak/BCATrak Server. Targeted advertising is also provided based on BCA information and content can be tailored for channel/banner/programming within PCFriendly software) based on consumer profile which is associated with BCA as shown in function block 238 RemoteSync.

FIG. 5 is a block diagram of a user experience in accordance with a preferred embodiment. The BCA number 503 is burned/added onto DVD 505. When the DVD is placed into a consumer's computer 510, InterActual's software automatically reads the BCA number and passes this information to the web server. The BCA information is passed to the web server, running an ISAPI extension 540, using either HTTP or FTP protocol 515. The information can be passed from a local "client" application, or an applet or ActiveX-type control can be downloaded from a web site that passed this information to the web server. The information is currently passed using an HTTP POST command using the syntax shown below.

```
http://www.pcfriendly.com/scripts/
RemoteAgentUpgrade.DLL&bca=
1234568790?userid=12 34568790?...
```

The current implementation of the web server is an ISAPI extension written in Visual C++ and is currently named RemoteAgentUpgrade.DLL for use with Microsoft Windows NT. Upon receiving the POST command, the ISAPI extension parses the information in the POST command to determine the BCA number and other associated information (such as user ID, etc.). This information is then logged in the web server log table 530, and is used to query specific information in the web server database 550 based on the POST. This flexible database structure enables a variety of uses of the BCA number.

A retailer example in accordance with a preferred embodiment is presented to assist one of ordinary skill in the art to make and use the invention without undue experimentation. A consumer inserts a DVD into their DVD-ROM drive. The consumer is presented with an HTML page with a "Buy-Me" button. Upon clicking the Buy-Me button, the consumer is connected to the Internet to a specific web page that

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includes an ActiveX control. The ActiveX control automatically connects to the ISAPI extension with BCA information for the currently inserted DVD. The ActiveX control also informs the ISAPI extension that the consumer is attempting an e-commerce transaction. The ISAPI extension parses the information from the POST command, and connects to the web server database. Since the ActiveX control informed the ISAPI extension that an e-commerce transaction is being attempted, the ISAPI extension connects to the web server database to determine the retailer from which the DVD was originally purchased. This can be determined because a web server database contains a BCA lookup table 560 with three fields:

BCA Number	#123458790
DVD Title Name	Lost In Space
Retailer/Store	Hollywood Video, Store #23

Using the Retailer/Store information, the appropriate e-commerce URL can be determined from Retailer table 570 that contains information specific for that Retailer:

Retailer/Store	Hollywood Video, Store #23
E-Commerce URL	http://www.retailer23.com/...

FIG. 6 is a flowchart of a redirect operation for an electronic commerce transaction utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing commences at 600 when a user inserts a DVD into a player and the electronic commerce operation is initiated by a user action as shown in function block 610. When the user selects the purchase option at 610, logic is initiated to read the BCA information and this information is combined with other user information from the server database as shown in function block 620. Then the server performs a table lookup to ascertain the retailer that sold the original DVD as shown in function block 630. The original retailer becomes the target for the purchase that the user initiated in function block 610, and the e-commerce transaction is re-routed to the retailer that sold the disk as shown in function block 640. Finally, a transaction is posted to the server database that memorializes the events associated with the re-direct operation.

FIGS. 7A and 7B are flowcharts setting forth the detailed logic associated with user connection and update for DVD processing in accordance with a preferred embodiment. Processing commences when a user connects to the Internet with a DVD application active as illustrated in function block 700. The remote agent detects the live internet connection and connects the application to a server for further processing as shown in function block 710. Then, the server connects the application with the appropriate version identification and upgrades the remote application if an upgraded version is available without further input from the user as shown in function block 720. If the user is a first time user, then the server obtains user information from the user utilizing, for example data from the DVD, or a query operation as shown in function block 730. Then, the application collects current DVD usage information and logs the information to a database as shown in function block 740. Finally, the current DVD information is transmitted to the user as shown in function block 750. Processing is then transferred to function block 752 of FIG. 7B where the application determines if any broadcast events are available. Then, in function block 754, if a user requests broadcast

events, then the server passes the information to the user in HTTP format as shown in function block 756. The remote agent receives the information from the server and converts the information for the particular DVD player as shown in function block 758, and ultimately logs user information in a database at the server as shown in function block 760.

#### General Advertising Flows

FIG. 8 is a flowchart setting forth the detailed logic for general advertising services in accordance with a preferred embodiment. The flowchart illustrates the detailed logic associated with presenting advertising (such as a banner) customized for a particular distributor/retailer/etc.

FIG. 8 presents logic demonstrating the display of specific advertising information based on a retailer/distributor utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing commences at 800 when a user inserts a DVD with BCA information into a player, and the advertising operation is initiated by a user action as shown in function block 810. When a user connects to a web page on the Internet at 810, logic is initiated to read the BCA information and this information is combined with other user information from the server database as shown in function block 820. Then the server performs a table lookup to ascertain the retailer that sold the original DVD as shown in function block 830. Once the original retailer is ascertained, the server performs another table lookup to determine the advertising banner as shown in function block 840. The advertising banner associated with original retailer is then displayed in the web site 810 as shown in function block 850. Finally a transaction is posted to the server database that memorializes the events associated with the advertising operation 860.

Distributors, retailers, computer or other hardware manufacturers, direct sales people, content developers or anyone who distributes, sells, or gives away DVDs will all receive benefits as detailed below in accordance with a preferred embodiment. Some of these include for example:

Blockbuster, DVDEpress, Amazon.com, Best Buy, Deluxe, Technicolor/Ninbusl, IBM, Gateway, Dell, Creative Labs, New Line, Warner, Activision, Electronic Arts, General Motors and Ford Motor Company.

FIG. 9 is a flowchart demonstrating the display of specific advertising information based on genre/type of DVD utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing commences at 900 when a user inserts a DVD with BCA information into a player, and the advertising operation is initiated by a user action as shown in function block 910. When the user connects to web page on the Internet at 910, logic is initiated to read the BCA information and this information is combined with other user information from the server database as shown in function block 920. Then the server performs a table lookup to ascertain the title and genre of the DVD as shown in function block 930. Once the title and genre is ascertained, the server performs another table lookup to determine the advertising banner as shown in function block 940. The advertising banner associated with the title and genre of the DVD is then displayed in the web site 910 as shown in function block 950. Finally a transaction is posted to the server database that memorializes the events associated with the advertising operation 960.

FIG. 10 is a flowchart of a download operation for downloading and updating retailer-specific information of the DVD utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing

commences at 1000 when a user connects to the Internet with a DVD application active. Logic detects a live Internet connection, reads the BCA information, and initiates a connection to the server as shown in function block 1010. After logic initiates the connection to the server in 1010, the DVD application requests all available downloads from the server for the retailer of the currently inserted DVD, as shown in function block 1020. The server performs a table lookup to ascertain the retailer that sold the original DVD as shown in function block 1030. Then the server performs another table lookup to determine the download information as shown in function block 1040. Once the download information is determined for the request initiated by the application in function block 1020, the server passes the download information to the application using HTTP protocol as shown in function block 1050. Finally a transaction is posted to the server database that memorializes the events associated with the download operation 1060.

FIG. 11 is a flowchart of a download operation for downloading and updating DVD title-specific information utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing commences at 1100 when a user connects to the Internet with a DVD application active. Logic detects a live Internet connection, reads the BCA information, determines DVD application version information, and initiates a connection to the server as shown in function block 1110. After logic initiates the connection to the server in 1110, the DVD application requests all available downloads from the server for the currently inserted DVD title, as shown in function block 1120. The server performs a table lookup to ascertain the DVD title as shown in function block 1130. Then the server performs another table lookup to determine the download information as shown in function block 1140. Once the download information is determined for the request initiated by the application in function block 1120, the server passes the download information to the application using HTTP protocol as shown in function block 1150. Finally a transaction is posted to the server database that memorializes the events associated with the download operation 1160.

FIG. 12 is a flowchart of a tailored video viewing operation utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing commences at 1200 when a user inserts a DVD into a player and video playback is initiated by a user action as shown in function block 1210. When the user selects the play video option at 1210, logic is initiated to read the BCA information and this information is combined with other user information from the server database as shown in function block 1220. The server performs a table lookup to ascertain the retailer that sold the original DVD as shown in function block 1230. Then the server performs another table lookup to determine the correct retailer video to play as shown in function block 1240. Once the retailer video information is determined for the request initiated by the application in function block 1210, the server initiates playback of the correct video for the retailer that sold the disk as shown in function block 1250. Finally a transaction is posted to the server database that memorializes the events associated with the video viewing operation operation 1260.

FIG. 13 is a flowchart of a tailored video viewing operation utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing commences at 1300 when a user inserts a DVD into a player and video playback is initiated by a user action as shown in function block 1310. When the user selects the play video option at 1310, logic is initiated to read the BCA information



and this information is combined with other user information from the server database as shown in function block 1320 and transmitted to the server. The server performs a table lookup to ascertain the genre and/or title as shown in function block 1330. Then the server performs another table lookup to determine the correct genre and/or title video to play as shown in function block 1340. Once the genre and/or title video information is determined for the request initiated by the application in function block 1310, the server initiates playback of the correct video for the genre and/or title as shown in function block 1350. Finally a transaction is posted to the server database that memorializes the events associated with the video viewing operation operation 1360.

FIG. 14 is a flowchart of the logic associated with a tailored multimedia viewing operation utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing commences at 1400 when a user inserts a DVD into a player and view is initiated by a user action as shown in function block 1410. When the user selects the view option at 1410, logic is initiated to read the BCA information as shown in function block 1420. The DVD application performs a local table lookup to ascertain the genre/title/retailer as shown in function block 1430. Then the DVD application performs another local table lookup to determine the correct multimedia element to display as shown in function block 1440. Once the multimedia element is determined for the request initiated by the application in function block 1410, the DVD application initiates playback of the correct multimedia element for the genre/title/retailer as shown in function block 1450. Finally a transaction is posted to the server database that memorializes the events associated with the multimedia viewing operation 1460.

#### Flowcharts for Security Processing in Accordance with a Preferred Embodiment

FIG. 15 is a flowchart of a security operation for restricting access to specific web sites utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing commences at 1500 when a user inserts a DVD into a player and the security operation is initiated by a user action as shown in function block 1510. When the user initiates connection to a secure web site at 1510, logic is initiated to read the BCA information and this information is combined with other user information from the server database as shown in function block 1520. Then the server performs a table lookup to ascertain if the user, based on the BCA number, is allowed access to the secure web site as shown in function block 1530. The server either allows or restricts entry to the web site based on the BCA number as shown in function block 1540. Finally a transaction is posted to the server database that memorializes the events associated with the security operation 1550.

FIG. 16 is a flowchart of a unlock operation for an electronic commerce transaction utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing commences at 1600 when a user inserts a DVD into a player and the unlock operation is initiated by a user action as shown in function block 1610. When the user selects the play/install DVD option at 1610, logic is initiated to read the BCA information and this information is combined with other user information from the server database as shown in function block 1620. Then the server performs a table lookup to ascertain if the DVD can be unlocked for playing or installation as shown in function block 1630. If the server determines that the user must first perform a purchase transaction, the server prompts

the user for any necessary transaction information as shown in function block 1640. After the user completes the transaction in function block 1640, or the server determines that a transaction occurred at an earlier time, or if the server determines that a transaction does not need to occur, the server performs the unlock operation as shown in function block 1650. Finally a transaction is posted to the server database that memorializes the events associated with the unlock operation 1660.

FIG. 17 is a flowchart of an unlocking operation for an electronic commerce transaction utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing commences at 1700 when a user inserts a DVD into a player and the unlock operation is initiated by a user action as shown in function block 1710. When the user selects the play/install DVD option at 1710, logic is initiated to read the BCA information and this information is combined with other user information from the server database as shown in function block 1720. The server performs a table lookup to ascertain the user information for the DVD using the BCA information as shown in function block 1730. Then the server performs a table lookup to ascertain if the DVD can be unlocked for playing or installation as shown in function block 1740. If the server determines that the user must first perform a purchase transaction, the server prompts the user for any necessary transaction information as shown in function block 1750. After the user completes the transaction in functional block 1750, or if the server determined that a transaction occurred at an earlier time, or if the server determines that a transaction does not need to occur, the server performs the unlock operation as shown in function block 1760. Finally a transaction is posted to the server database that memorializes the events associated with the unlocking operation 1770.

FIG. 18 is a flowchart of a logging operation for tracking piracy and misuse of a DVD utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing commences at 1800 when a user inserts a DVD into a player and the logging operation is initiated by a user action as shown in function block 1810. When the user user selects the play/install DVD option at 1810, logic is initiated to read the BCA information and this information is combined with other user information from the server database as shown in function block 1820. The server performs a table lookup to ascertain if the user, based on the BCA number, is allowed to apply or install the DVD as shown in function block 1830. Then the server either enables or disables the DVD for playback/installation as shown in function block 1840. Finally a transaction is posted to the server database that memorializes the events associated with the logging operation 1850. The logging information can be used to localize pirated discs to a specific region, track illegal region code use, and trace misuse/pirated DVDs back to retailer, distributor, manufacturer, or content developer.

#### Support Services

FIG. 19 is a flowchart of a redirect operation for a support transaction for intelligent processing in accordance with a preferred embodiment. Processing commences at 1900 when a user inserts a DVD with BCA information into a player, and the redirect operation is initiated by a user action as shown in function block 1910. When the user selects the support option at 1910, logic is initiated to read the BCA information and this information is combined with other user information from the server database as shown in function block 1920. Then the server performs a table

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lookup to ascertain the support organization for the original DVD as shown in function block 1930. The support organization becomes the target for the support request that the user initiated in function block 1910, and the support transaction is re-routed to the support organization associated with the DVD in function block 1940. Finally a transaction is posted to the server database that memorializes the events associated with the redirect operation 1950.

FIG. 20 is a flowchart of a display operation for a support transaction for intelligent processing in accordance with a preferred embodiment. Processing commences at 2000 when a user inserts a DVD with BCA information into a player, and the display operation is initiated by a user action as shown in function block 2010. When the user selects the support option at 2010, logic is initiated to read the BCA information and this information is combined with other user information from the server database as shown in function block 2020. Then the server performs a table lookup to ascertain the DVD-specific support information for the DVD in the user's player as shown in function block 2030. Once the server has determined the DVD-specific information for the support request initiated by the user in function block 2010, the DVD-specific information is displayed to the user in function block 2040. Finally a transaction is posted to the server database that memorializes the events associated with the display operation 2050.

FIG. 21 is a flowchart of support tracking utilizing BCA for intelligent processing in accordance with a preferred embodiment. Processing commences at 2100 when a user inserts a DVD with BCA information into a player, and the display operation is initiated by a user action as shown in function block 2110. When the user selects the support option at 2110, logic is initiated to read the BCA information and this information is combined with other user information from the server database as shown in function block 2120. Then the server performs a table lookup to ascertain the DVD-specific support information for the DVD in the user's player as shown in function block 2130. Once the server has determined the DVD-specific information for the support request initiated by the user in function block 2110, the DVD-specific information is used, for example, to track retailer-specific support issues or geographical support issues as shown in function block 2140. Finally a transaction is posted to the server database that memorializes the events associated with the display operation 2150 and the memorialized information is utilized to generate reports tracking retailer-specific support issues or geographical support issues.

FIG. 22 is a flowchart of a redirect operation for a support transaction for intelligent processing in accordance with a preferred embodiment. Processing commences at 2200 when a user inserts a DVD with BCA information into a player, and the redirect operation is initiated by a user action as shown in function block 2210. When the user selects the support option at 2210, logic is initiated to read the BCA information and this information is combined with other user information from the server database as shown in function block 2220. Then the server performs a table lookup to ascertain the support organization for the original DVD as shown in function block 2230. The support organization becomes the target for the support request that the user initiated in function block 2210, and, if allowed, the support transaction is re-routed to the support organization associated with the DVD in function block 2240. Otherwise, the user is redirected to a location informing the user that support location is not available. Finally a transaction is posted to the server database that memorializes the events associated with the redirect operation 2250.

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FIG. 23 is a flowchart of a broadcast operation for downloading update, support and application information utilizing BCA information for intelligent processing in accordance with a preferred embodiment. Processing commences at 2300 when a user connects to the Internet with a DVD application active. Logic detects a live Internet connection, reads the BCA information, determines DVD application version information, and initiates a connection to the server as shown in function block 2310. After logic initiates the connection to the server in 2310, the DVD application requests all broadcast information from the server for the the DVD, as shown in function block 2320. The server performs a table lookup to ascertain the broadcast information for the DVD as shown in function block 2330. Once the broadcast information is determined for the request initiated by the application in function block 2320, the server passes the broadcast information to the application using HTTP protocol as shown in function block 2340. Then the DVD application acts upon the broadcast information by either presenting information to the user or automatically acting upon the information as shown in function block 2350. Finally a transaction is posted to the server database that memorializes the events associated with the download operation 2360. The e-commerce URL is then returned to the ActiveX control so that the consumer's purchase request can be redirected to the appropriate URL.

Visual C++ code in accordance with a preferred embodiment is provided below to further embellish the description of the invention. \* These functions are used to obtain BCA information \* \* DATE NAME REASON \* ---- \* Mar. 22, 1999 ITI Created \* \* NOTES: \* \* © COPYRIGHT 1999 InterActual Technologies, Inc. ALL RIGHTS RESERVED. #include "stdafx.h" #include "scsidefs.h" #include "wnaspi32.h" DWORD xReportBCA (LPBYTE pbData, WORD cbData); DWORD WINAPI SendCommand(LPBYTE pPacket, LPBYTE pBuffer, DWORD cbBuffer); DWORD WINAPI Init(int index); void WINAPI Uninit(); DWORD xReportBCA(LPBYTE pbData, WORD cbData) DWORD nReturn; UCHAR Cdb[16]; DWORD bWindowsNT FALSE; OSVERSIONINFO vi; vi.dwOSVersionInfoSize = sizeof(vi); if (GetVersionEx(&vi)) bWindowsNT = (vi.dwPlatformId == VER\_PLATFORM\_WIN32\_NT); if (bWindowsNT) return FALSE; // for now not implemented ZeroMemory(&Cdb, sizeof(Cdb)); Cdb[0] = 0xAD; // CMD\_READ\_DVD\_STRUC; Cdb[7] = 0x03; // Format Cdb[8] = HIBYTE(cbData); // sizeof AllocationLength Cdb[9] = LOBYTE(cbData); // sizeof AllocationLength Cdb[10] = 0; // Agid nReturn = WINAPI SendCommand(Cdb, pbData, cbData); return nReturn; typedef DWORD (\_cdecl \*LPFNSENDASPI32COMMAND)(LPSRB); typedef DWORD (\_cdecl \*LPFNGETASPI32SUPPORTINFO)(VOID); BOOL WINAPI InquiryCmd(BYTE \*pbInq, WORD cbData); // statics yuk static BYTE AdapterCount=0; static BYTE AdapterID=0; static BYTE TargetID=0; LPFNSENDASPI32COMMAND g\_fnSendASPI32Command = NULL; LPFNGETASPI32SUPPORTINFO g\_fnGetASPI32SupportInfo = NULL; HINSTANCE g\_hWNASPI=NULL; DWORD WINAPI Init(int index) { if (g\_fnSendASPI32Command & g\_fnGetASPI32SupportInfo) return TRUE;

```

    if (! (g_hWNASPI = LoadLibrary("WNASPI32. DLL")))
        return FALSE;
    if (NULL == (g_fnSendASPI32Command = (LPFNSENDASPI32COMMAND) GetProcAddress(ghWNASPI, "SendASPI32Command"))) return FALSE; if
    (NULL == (g_fnGetASPI32SupportInfo = (LPFNGETASPI32SUPPORTINFO) GetProcAddress(g_hWNASPI, "GetASPI32SupportInfo"))) return FALSE;
    DWORD ASPI32Status = (*g_fnGetASPI32SupportInfo)();
    AdapterCount = (LOBYTE(LOWORD(ASPI32Status))); if
    ((AdapterCount == 0) || (HIBYTE(LOWORD(ASPI32Status)) != SS_COMP)) return FALSE;
    BYTE pblnq[LEN_INQUIRY_DATA+1];
    for (BYTE aid = 0; aid < AdapterCount; aid++) for (BYTE
    tid = 0; tid < MAX_TARGET; tid++) { AdapterID = aid;
        TargetID = tid;
        if (AspiInquiryCmd(pblnq, LEN_INQUIRY_DATA)) { if
        (DTYPE_CROM == pblnq[0]) { if(index == 0) { return
        TRUE;
            return FALSE; } void AtapiUninit() { if (g_hWNASPI) {
            FreeLibrary(ghWNASPI); g_fnSendASPI32Command = NULL;
            g_fnGetASPI32SupportInfo = NULL;
            ghWNASPI = NULL;
        } DWORD AtapiSendCommand(BYTE *pCdb, BYTE
        *pbData, DWORD cbData) {
            PSRB_ExecSCSICmd pSrb = (PSRB_ExecSCSICmd)
            malloc(sizeof(SRB_ExecSCSICmd));
            if (pSrb == NULL) return FALSE;
            memset(pSrb, 0, sizeof(SRB_ExecSCSICmd));
            II SendCommand pSrb->SRB_Cmd = SC_EXEC_SCSI
            CMD;
            pSrb->SRB_Status = 0xff;
            pSrb->SRB_HaId = AdapterID;
            if ((pCdb[0] == 0xA3) && (cbData != 0)) pSrb-
            >SRB_Flags = SRB_DIR_OUT;
            else if (pCdb[0] == 0x43) pSrb->SRB_Flags
            = SRB_DIR_IN;
            else pSrb->SRB_Flags = SRB_DIR_SCSI;
            pSrb->SRB_Target = TargetID;
            pSrb->SRB_BufLen = (DWORD)cbData;
            pSrb->SRB_BufPointer = pbData;
            pSrb->SRB_SenseLen = SENSE_LEN; pSrb-
            >SRB_CDBLen = LEN_ATAPI_PACKET; pSrb-
            >SRB_HaStat = 0xff; pSrb->SRB_TargStat = 0xff; memcpy(
            pSrb->CDBByte, pCdb, LEN_ATAPI_PACKET);
            DWORD ASPI32Status = (*g_fnSendASPI32Command)
            (pSrb); DWORD timeout = 600; while ((pSrb->SRB_Status
            == SS_PENDING) && (timeout > 0)) { Sleep(10); timeout--; }
            if (pSrb->SRB_Status == SS_COMP) { free(pSrb); return
            TRUE; if ((pSrb->SRB_Status == SS_ERR) && (pSrb-
            >SRB_TargStat != STATUS_CHKCOND)) { } free(pSrb);
            return FALSE; } BOOL AspiInquiryCmd(BYTE *pblnq,
            WORD cbData) { BYTE Cdb[LEN_ATAPI_PACKET];
            memset(Cdb, 0, LEN_ATAPI_PACKET); Cdb[0]
            = SCSI_INQUIRY; Cdb[4] = LEN_INQUIRY_DATA; PSR-
            B_ExecSCSICmd pSrb = (PSRB_ExecSCSICmd) malloc
            (sizeof(SRB_ExecSCSICmd)); if (pSrb == NULL) return
            FALSE; memset(pSrb, 0, sizeof(SRB_ExecSCSICmd));
            pSrb->SRB_Cmd = SC_EXEC_SCSI_CMD; pSrb-
            >SRB_Status = 0xff; pSrb->SRB_HaId = AdapterID; pSrb-
            >SRB_Flags = SRB_DIR_SCSI; pSrb->SRB_Target = Tar-
            getID; pSrb->SRB_BufLen = (DWORD)cbData; pSrb-

```

```

    >SRB_BufPointer = pblnq; pSrb->SRB_SenseLen
    = SENSE_LEN; pSrb->SRB_CDBLen = 6; pSrb->SRB
    HaStat = 0xff; pSrb->SRB_TargStat = 0xff; memcpy(pSrb-
    >CDBByte, Cdb, LEN_ATAPI_PACKET); // Send Com-
    mand 20 DWORD ASPI32Status
    (*g_fnSendASPI32Command)(pSrb); DWORD timeout
    = 600; /* Wait for pending status */ while ((pSrb->SRB-
    Status == SS_PENDING) && (timeout > 0)) Sleep(10);
    timeout--; /* Check Error Code */ if (pSrb->SRB_Status
    == SS_COMP) { free(pSrb); return TRUE; /* Set last device
    error */ if ((pSrb->SRB_Status == SS_ERR) && (pSrb-
    >SRB_TargStat != STATUS_CHKCOND)) free(pSrb);
    return FALSE;

```

#### Alternate Embodiments

It should be noted that various permutations of serializa-  
tion may be employed including, but not limited to a  
watermark, hologram, and any other type in substitution or  
combination with the BCA information without diverging  
from the spirit of the claimed invention.

#### Watermarking

Digital video data can be copied repeatedly without loss  
of quality. Therefore, copyright protection of video data is a  
more important issue in digital video delivery networks than  
it was with analog TV broadcast. One method of copyright  
protection is the addition of a "watermark" to the video  
signal which carries information about sender and receiver  
of the delivered video. Therefore, watermarking enables  
identification and tracing of different copies of video data.  
Applications are video distribution over the World-Wide  
Web (WWW), pay-per-view video broadcast, or labeling of  
video discs and video tapes. In the mentioned applications,  
the video data is usually stored in compressed format. Thus,  
the watermark must be embedded in the compressed  
domain. An approach for robust watermarking of MPEG-2  
encoded video is presented in accordance with an alternate  
embodiment. The method is of much lower complexity than  
a complete decoding process followed by watermarking in  
the pixel domain and re-encoding. Although an existing  
MPEG-2 bitstream is partly altered, the method avoids drift  
by adding a drift compensation signal. The method has been  
implemented and the results confirm that a robust watermark  
can be embedded into MPEG-encoded video which can be  
used to securely transmit arbitrary binary information at a  
data rate of several bytes/second.

The method is easily applicable to other video coding  
schemes like MPEG-1, H.261, and H.263. Digital water-  
marks exist at a convergence point where creators and  
publishers of digitized multimedia content demand  
localized, secured identification and authentication of that  
content. Because existence of piracy is clearly a disincentive  
to the digital distribution of copyrighted works, establish-  
ment of responsibility for copies and derivative copies of  
such works is invaluable. In considering the various forms  
of multimedia content, whether "master," stereo, NTSC  
video, audio tape or compact disc, tolerance of quality  
degradation will vary with individuals and affect the under-  
lying commercial and aesthetic value of the content.

It is desirable to tie copyrights, ownership rights, pur-  
chaser information or some combination of these and related  
data to the content in such a manner that the content must  
undergo damage, and therefore a reduction in value, with  
subsequent, unauthorized distribution of the content,  
whether it be commercial or otherwise. Legal recognition  
and attitude shifts, which recognize the importance of digital  
watermarks as a necessary component of commercially  
distributed content (audio, video, game, etc.), will further



the development of acceptable parameters for the exchange of such content by the various parties engaged in the commercial distribution of digital content.

These parties may include artists, engineers, studios, Internet access providers, publishers, agents, on-line service providers, aggregators of content for various forms of delivery, on-line retailers, individuals and parties that participate in the transfer of funds to arbitrate the actual delivery of content to intended parties. Since the characteristics of digital recordings vary widely, it is a worth while goal to provide tools to describe an optimized envelope of parameters for inserting, protecting and detecting digital watermarks in a given digitized sample (audio, video, virtual reality, etc.) stream. The optimization techniques described hereinafter make unauthorized removal of digital watermarks containing these parameters a significantly costly operation in terms of the absolute given projected economic gain from undetected commercial distribution. The optimization techniques, at the least, require significant damage to the content signal, as to make the unauthorized copy commercially worthless, if the digital watermark is removed, absent the use of extremely expensive tools. Presumably, the commercial value of some works will dictate some level of piracy not detectable in practice and deemed "reasonable" by rights holders given the overall economic return. For example, there will always be fake \$100 bills, LEVI jeans, and GUCCI bags given the sizes of the overall markets and potential economic returns for pirates in these markets—as there also will be unauthorized copies of works of music, operating systems (Windows 98, etc.), video and future multimedia goods. However, what differentiates the "digital marketplace" from the physical marketplace is the absence of any scheme that establishes responsibility and trust in the authenticity of goods. For physical products, corporations and governments that mark the goods and monitor manufacturing capacity and sales to estimate loss from piracy. There are also no reinforcing mechanisms, including legal, electronic, and informational campaigns to better educate consumers.

With the advent of digital video and digital video broadcasting, issues of copyright protection have become more important, since the duplication of digital video does not result in the inherent decrease in quality suffered by analog video. One method of copyright protection is the addition of a "watermark" to the video signal. The watermark is a digital code embedded in the bitstream of the digital video that typically identifies the copyright owner. The watermark, if applied to individual copies of the video, may also be used to identity of the receiver of each copy. This processing identifies illegally reproduced copies and facilitates tracing back to the receiver from which they originated. For watermarking of digital video, a number of different characteristics of the watermark are desirable. First, the watermark should be embedded in such a way that it is imperceptible or barely perceptible to a viewer of the video. Secondly, the watermark should be such that it cannot be removed by intentional or unintentional operations on the digital video bitstream or on the decoded video without, at the same time, degrading the perceived quality of the video to the point of significantly reducing its commercial value (a characteristic referred to as "robustness"). Thirdly, since the video may be stored for broadcast in a compressed form (such as in a "video-on-demand" server), it is desirable to be able to incorporate the watermark into the bitstream without having to decode the signal first and to re-encode it after adding the watermark. This can be accomplished with the watermarking of digital still images, but the method used

does not lend itself to digital video, due to the additional constraints which video signals present. Many digital video applications are "constant bit rate" applications, which do not tolerate increases in the bit rate of the transmitted bitstream. Even in those applications which are not restricted to a constant bit rate, unnecessary increases in the bit rate should be avoided, so as to preserve the real-time decodability of the video signal when transmitted over a channel having a given bandwidth. Thus, it is desirable that the addition of the watermark does not increase the bit rate of the video signal. Past watermarking techniques for digital video are limited to the watermarking of uncompressed video data. However, since video sequences are often stored in a compressed format (thereby saving on memory space), watermarking the signal in a way which uniquely identifies each receiver of the signal would require decoding of the signal, addition of the watermark, and recoding before the signal is transmitted. This clearly places a significant time and processing burden on the task of delivering the video sequence.

#### Hologram

Information exchange and transfer over a shared transmission channel present a challenge to the security of sensitive information. Internet and Intranet are two examples of such a shared information transmission channeling which many computers are connected with one another by local or wide area communication networks. It is therefore possible for any user or an intruder to intercept a package of sensitive data that is transmitted over the shared channel. In particular, the internet is a rapidly growing business forum and securing information transferred through its channels is becoming a major concern for transmitting proprietary information. Data encryption techniques can be used to increase the security in data exchange and transfer over a shared transmission channel. In its simplest form, data encryption uses a "key" based on a particular algorithm to change the sequence of a package of data that contains a piece of confidential information ("plain text") so that the data is enciphered or "scrambled" into an form that appears to have no correlation with the embedded confidential information ("cipher text"). An unauthorized user, who does not have the knowledge of either the encryption method (e.g., the encryption algorithm) or the key formed based on the encryption method, cannot easily decode the information. An authorized user recovers the embedded information in the scrambled data by using a "key" that is constructed based on the encryption method. Therefore, even if the unauthorized user obtains the scrambled data, the knowledge of both of the encryption method and the particular key is needed to decrypt the confidential information embedded therein.

One well-known encryption system is the Data Encryption Standard (DES) adapted in 1977 by the National Bureau of Standards. This is a secret-key crypto system to exploit confusion and diffusion techniques, allowing acceptable security using key lengths as short as 64. The number of keys in crypto systems based on the DES can be as many as 512 keys with the current computational power. However, increased key lengths "cost" significant delays in transmitting and receiving the encoded information. Two main kinds of crypto systems are a symmetrical system, i.e., the private key system, and an asymmetrical system, i.e., the public-private key system. The DES symmetric crypto systems typically encrypt 64 bit blocks of plain text using a key length of 56 bits. The fundamental building blocking DES (referred to as a round) is a single combination of a substitution followed by a permutation of the text, based on the key.

The plain text is encoded through 16 rounds of a function, which usually implement substitution, permutation, XOR and shift operations on subsets of the text and the key in such a way that every bit of the cipher text depends on every bit of the plain text and every bit of the key. This means that if a single bit of the cipher text is corrupted during transmission, the entire message may be lost. This is another weakness of DES-type block ciphers. In each round, a different subset of the elements from the key,  $K_i$ , are used to perform the encryption (hence  $K_1$  is applied during the first round, and  $K_i$  is applied during the  $i$ th round, etc.). An analogous algorithm is used to decrypt the cipher text, but the keys are now applied in reverse order, and the shift operations change from left to right. Given the complexity of the DES algorithm, the speed at which DES is encrypted is a function of the processor characteristics for both hardware and software implementations. For example, Digital Equipment Corporation makes a hardware DES chip which can encrypt and decrypt at a rate of 1 Gbit/sec, or 15.6 million DES blocks per second. Software implementations are slower; for example, an IBM 3090 mainframe can encrypt 32,000 DES blocks per second.

Typical software implementation performances for microcomputers are listed in the Table 1 herein. TABLE 1 Encryption Rates using some microprocessors

Bus width	DES Blocks	Processor Speed (MHz)	(bits)	(per/sec)
8088	4.7	8		
37068000	7.6	16	90080286	6.0
16	1,100	68020	16.0	32
3,500	68030	16.0	32	3,900
80280	25.0	16	5,000	68030
50.0	32	9,600	68040	25.0
32	16,000	68040	40.0	32
23,200	80486	33.0	32	40,600

Another prior art cryptography system is the RSA Public Key Crypto system available from the RSA Data Security in California. RSA is an asymmetric crypto system in which two different keys are used: a public key to encrypt the plain text and a private key to decrypt the cipher text. The hardware implementations of RSA are usually about 1000 to 10,000 times slower than a hardware implementation of DES. In software implementations, RSA is generally about 100 times slower than DES. These numbers will improve as technology advances, but the processing speed of RSA will be difficult to approach the speed of a symmetric crypto system. Consequently, RSA is generally not viewed as a replacement for DES or any other fast bulk encryption algorithm. Instead, RSA is often used for secure key exchange without prior exchange of secrets. Hence a long message is encrypted with DES.

The message is sent with its DES key encrypted via RSA public key encryption. Many other prior-art encryption systems are variations of the DES-type encryption. Generally, it is suspected that given the advanced state of computational processors, DES may no longer be safe against a brute-force attack, so alternatives have actively been sought since the late 1980's. In response to this need, several alternatives have been developed and are thought to be competitive with DES in terms of the level of security provided. Examples of these systems include the following encryption methods.

(1) Triple DES. This is a variation of DES where the plain text is encrypted with the DES algorithm by three different keys in succession. This is commonly accepted to be equivalent to increasing the size of the DES key to 112 bits. Triple encryption of the plain text is the current method of dealing with misgivings about DES's security, but this is clearly done at the expense of the throughput rate for encrypting and decrypting messages.

(2) REDOC, a block algorithm which has a 20 byte (160-bit key) and that operates on an 80 bit block. All of the manipulations, (i.e. substitutions, permutations, and key

XOR's) are performed on bytes, which makes it more efficient in software than DES whose initial and final permutations are difficult to efficiently implement in software. In addition, the 160 bit key usually makes this algorithm very secure.

(3) Khufu is a recently proposed 64 bit block cipher, which calls for a 512-bit key, and leaves the number of rounds open (either 16, 24, or 32). Because of the large key, and the potentially expanded number of rounds, the security of this algorithm is expected to be very high. However, increasing the number of rounds has the disadvantage of slowing the rate at which data can be encrypted.

(4) IDEA is a 64-bit block cipher that utilizes a 128 bit key. It usually utilizes three basic operations, XOR, addition modulo  $2^{16}$ , and multiplication modulo  $2^{16}$ . The algorithm typically operates on 16-bit sub-blocks, which makes it efficient, even on 16 bit processors. Its current software implementations are about as fast as DES. In view of the limitations and disadvantages of the various prior-art encryption systems, the inventors of the present invention developed a new crypto system based on optical phase modulation and a corresponding implementation interface between a user computer and the network. An embodiment in accordance with the present invention can exchange any of these methods for enciphering information embedded in a digital bit stream prior to digitization and transmission over a shared network such as the internet.

A holographic de-scrambler can be used at the receiving end in accordance with a preferred embodiment by an authorized user to decipher the information. One of many advantages of the present invention is the potential to achieve high rate of encryption/decryption (e.g., larger than 1 Gbit/s) as optical fiber networks of high data rates (e.g., larger than 2.4 Gbit/s) become more common. In one of several preferred embodiments of the present invention, a package of digital data is first imprinted on a carrier light beam. This is done by using a two-dimensional spatial light modulator. The phase of the data-bearing optical waveform is subsequently distorted by a phase-scrambling medium. Next, the data-bearing optical waveform with distorted phase is used to form an optical hologram with a reference beam. The hologram is then converted into electronic signals which are sent to its destination in digital form over a shared transmission channel. At the destination where the scrambled data is received, the hologram is displayed in a spatial light modulator and a conjugate reconstruction thereof is performed to generate a conjugate of the data-bearing signal waveform with distorted phase. A holographic medium having information indicative of the phase-scrambling medium is used to unscramble the phase and the embedded data is retrieved from the conjugate reconstruction optical waveform by using a light detector array such as a CCD array. One aspect of the present invention is to achieve optical encryption keys up to and greater than  $10^{16}$  keys to enhance the security.

This is a difficult implementation for many prior art systems. Such a large number of encryption keys is possible because of the unique optical analog technique in accordance with the present invention. It is another aspect of the present invention to insure fast enciphering and deciphering of a large encryption key that are rarely obtainable with the prior-art systems. The preferred embodiments implement this by using the high-speed optical reconstruction of a data-bearing hologram and the capability of parallel processing of optical data processing devices. It is yet another aspect of the present invention to increase the confidentiality of the encryption schemes by using unconventional analog-

based enciphering and deciphering of digital data. This aspect is particularly advantageous in view of the current lack of a theoretical foundation for decrypting analog-based encryption. A brute force attacked encryption based on algorithm techniques is nearly impossible for invading the cryptography systems in accordance with the present invention. It is yet another aspect of the present invention to use optical phase information in a nonobvious way to encipher and decipher digital data. It is yet another aspect of the present invention that optical holographic techniques are used in both enciphering and deciphering processes to further enhance the confidentiality of the encryption systems in accordance with the present invention. It is yet another aspect of the present invention that the phase conjugate reconstruction of data-bearing holograms are implemented in preferred embodiments to ensure the high fidelity of the analog deciphering process. It is yet another aspect of the present invention to integrate optical processing technology, hardware encryption, opto-electronic interfacing, and high-fidelity and fast-speed digital signal transmission to form a highly secure, fast and versatile encryption system that works independent of the transmission media utilized. It is still another aspect of the present invention to complete the encryption or decryption process in a single step, instead of the 16 rounds of complex computations typically found in most symmetric encryption schemes. In the optical encryption systems in accordance with the present invention, the encrypting speed is usually not limited by the size of the encryption key, but rather by the system speed in converting between the electronic-to-optical and the optical-to-electronic information modes.

#### Other Serialization

In the past, merchants have unsuccessfully employed various methods in an attempt to track and identify their inventory. Engraving, stamping, painting, and marking are several methods that merchants have employed. Due to practical problems, those methods are not effectively applicable to the CD multimedia rental industry.

As is known in the art and industry of compact disc multimedia, graphical information identifying the program title and author of a recording is ordinarily placed on the top surface of a CD. Digital data is stored on or just below that top surface. In particular, digital data is stored immediately below such graphical information between the top surface and the bottom surface of the CD. The bottom surface of the CD is comprised of a section of clear material through which, in accessing the data, a laser beam from a compact disc player radiates upward.

The digital data is delicate and can easily be damaged during processes typically used to identify merchandise, which include engraving, stamping, or marking. As stated above, the digital data is closer to the top surface of the CD than it is to the bottom surface. Although the top surface of a CD usually contains graphical information applied by silk screening that partially protects the digital data from damage, the silk screened layer is thinner and more fragile than the bottom surface of a CD which comprises clear material. Thus, there is a greater need to protect the top surface of the CD and the digital data close to it from physical damage such as scratching.

Engraving may be used to identify merchandise. Engraving CDs with identification markings is problematic since engraving is often attempted on the top surface of the CD and such engraving could interfere with the digital data next to it. Moreover, even if engraving is attempted on the bottom surface of a CD where it is less likely that digital data will be damaged, the data may still be damaged during engraving

due to the pressure required to be placed on the top of the CD to hold it in place and the heat that may result from such engraving. In addition, engraving may be undesirable since it is a relatively labor intensive and costly process, especially in high volume situations.

Thus, merchants have considered other less invasive methods of identification such as, for example, painting. Painting also fails to provide an effective means of identification or security due to the labor required, the cost required, and the inherent unreliability of the process given the ease with which a person can duplicate such painting. Moreover, painting may pose other problems since harm to the digital data must be avoided.

Still another option of identifying and securing inventory is the use of ordinary adhesive stickers. Such stickers do not provide an effective means of identification due to the ease with which such stickers can be removed and reattached to similar looking items without a means of clearly indicating any tampering with the sticker. In addition, such stickers may be difficult to manually apply to CDs (since any sticker should be precisely centered on the CD) in the absence of an applicator workstation such as the one disclosed herein. In addition, such stickers may be easy to duplicate.

Magnetic-type EAS systems are widely used to inhibit the theft of merchandise such as clothing, books, cassettes and compact disks. Electronic article surveillance (EAS) systems are often used to prevent unauthorized removal of articles from a protected area, such as a library or retail store. An EAS system usually includes an interrogation zone or corridor located near the exit of the protected area and markers or tags attached to the articles to be protected. EAS systems have been based on magnetic, RF, microwave and magneto-restrictive technologies. Regardless of the particular technology involved, the EAS systems are designed such that the tag will produce some characteristic response when exposed to an interrogating signal in the corridor. Detection of this characteristic response indicates the presence of a sensitized tag in the corridor. The EAS system then initiates some appropriate security action, such as sounding an audible alarm, locking an exit gate, etc. To allow authorized removal of articles from the protected area, tags that are either permanently or reversibly deactivatable (i.e., dual status tags) are often used.

Although EAS markers have been in common use for the theft protection of optically recorded media such as compact disks and CD-ROM's, the markers have generally been adapted for attachment to the packages containing new compact disks and have been poorly suited for direct attachment to the compact disk itself for libraries and other institutions that repeatedly check compact disks in and out to accommodate the needs of customers and clients, effective inventory control would prefer that EAS markers are attached to the compact disk.

Some markers for direct attachment to compact disks have been developed. One, available as "DCD-1" from Minnesota Mining and Manufacturing Company, St. Paul, Minn., is a single marker strip and security overlay which are attached to a compact disk. However, this marker adversely affects the mechanical balance of the disk, which can adversely affect the operation of modern high rotation speed CD-ROM drives, CD players, and other optically recorded media playback equipment which require that the media be mechanically balanced for proper operation. Another product, "CD-Guard", available from Knogo North America, Inc., Hauppauge, Long Island, N.Y., suffers the same mechanical balance drawback. An optical information storage disk comprising an embedded, generally annular,



dual-status EAS marker is described in coassigned U.S. Pat. No. 5,347,508.

#### Other Media

It should be noted that the principles of the present invention may be applied to other types of media beyond the electronic storage medium discussed hereinabove. As a disk-like recording medium (referred to hereinafter as an optical disk) on and from which an information signal is recorded and reproduced by laser beam, there are now commercially available a so-called compact disc with audio data recorded therein, a CD-ROM in which computer data is recorded, a write once optical disk on which an information signal can be recorded once and a recordable optical disk in which an information signal can be reproduced, recorded and erased.

The read-only optical disk such as a compact disc or CD-ROM has tracks on which irregular patterns, i.e., phase pits are concentrically or spirally formed on the basis of a recorded information signal formed on one surface thereof. Specifically, the read-only optical disk is composed of a disk base plate made of a transparent synthetic resin such as polycarbonate or PMMA (polymethyl methacrylate), a reflection film made of a metal such as Al or Au formed so as to cover phase pits formed on one surface of the disk base plate and a protection layer formed so as to cover the reflection film in order to protect the reflection film.

When an information signal is reproduced from the read-only optical disk, laser beam from a laser light source is converged by an objective lens and irradiated on the read-only optical disk from the disk base plate side. Reflected light flux modulated by the phase pits on the optical disk is detected by a photodetector, for example, and converted into a detected signal having a signal level corresponding to an intensity of reflected light flux, thereby allowing a reproduced signal of the information signal recorded on the read-only optical disk to be obtained.

While the read-only optical disk can provide mass-produced products (optical disks) inexpensively on the market, it is not suitable for products of small demand. For this end, write once optical disks are prepared for optical disk products of small demand and a variety of data can be provided to the user easily. As write once optical disks, there are available a write once optical disk of recording system using physical chemical change of pigment, a write once optical disk of a single layer hole forming recording system, a write once optical disk of multi-layer hole forming recording system, a write once optical disk of phase-change recording system and a write once optical disk of bubble-foaming system. Upon reproduction, in a manner similar to the read-only optical disk, a laser beam (having a weak reproduction laser power) from a laser light source is irradiated on the disk from the disk base plate side under the condition that the laser beam is converged by an objective lens. Then, reflected light flux that is modulated by previously-recorded pits is detected by a photodetector and the detected signal is converted into a detected signal having a signal level corresponding to an intensity of a reflected light bundle, thereby obtaining a reproduced signal of an information signal recorded on the write once optical disk.

When an information signal is recorded on the above write once optical disk, a laser beam (having a strong recording laser power) from a laser light source is irradiated on the optical disk from the disk base plate side under the condition that the laser beam is converged by an objective lens. Then, the power of the laser beam is turned on and off

by modulating the laser beam in response to an information signal and pits (pits substantially similar to those recorded on the read-only optical disk) corresponding to the information signal are formed along recording tracks of the optical disk. Specifically, in the case of the single layer hole forming recording system, a hole is formed on the recording track at an area irradiated with a strong laser beam and this hole is recorded as a pit. In the case of a multi-layer hole forming recording system, a hole is formed on the recording track at an area irradiated with a strong laser beam, e.g., the film of the first layer and the hole on the first layer are recorded as a pit.

In the case of the phase change recording system, a portion of the recording track irradiated with a strong laser beam is changed from the amorphous state to the crystal state and the portion that was changed to the crystal state is recorded as a pit. In the case of the bubble foaming recording system, of the recording tracks, a recording layer of the portion irradiated with a strong laser beam is upheaved and the upheaved portion is recorded as a pit.

In the write once optical disk, in particular, a guide groove is formed (pre-groove portion) to allow tracking control of laser beam. An end face opposing the pre-groove is formed as a sine wave shape (generally referred to as a wobble shape) having a predetermined amplitude and a predetermined period along the track. When this wobble shape is optically detected by laser beam, it is possible to obtain a wobble signal serving as absolute time information. The wobble signal is used to control the system of the recording and reproducing apparatus and, in particular, the timing information for recording pits on the optical disk. Further, the wobble signal is used to servo-control an optical disk rotating and driving means, e.g., a spindle motor. According to the servo control operation, the rotational speed of the spindle motor is controlled such that the period of the wobble signal becomes constant.

The above write once optical disk is generally of a groove recording system where pits are recorded on the pre-groove portion. When information data that is to be recorded on the write once optical disk is recorded, a target position is synchronously searched based on the period of the wobble signal obtained by optically detecting the wobble shape formed on the pre-groove portion. When the target position is detected, the above information data that is to be recorded on the write once optical disk is recorded on the target position according to a predetermined format.

On the other hand, upon reproduction, a target position is searched as described above. When the target position is detected, based on a frame synchronizing signal inserted into the data to be recorded on the write once optical disk, 2 kilobytes of data, for example, are sequentially read out, thereby reproducing recorded data.

Since the read-only optical disk and the write once optical disk are the same in reproduction principle as described above, even when the write once optical disk is loaded onto a reproducing apparatus which reproduces an information signal from the read-only optical disk, data recorded on the write once optical disk can be reproduced without distinction of the read-only optical disk.

In addition, the write once optical disk has a feature that allows a number of optical disks to be easily produced by relatively simple equipment. For this reason, there is the risk that the write once optical disk will be illegally copied (illegal copy). Specifically, initially, there is a computer system wherein a reproducing apparatus for reproducing an information signal from a read-only optical disk is con-

nected to one external input and output terminal of a personal computer used by the end user. For example, and an external storage device for recording and reproducing an information signal on and from the write once optical disk is connected to another external input and output terminal. Then, recorded data that had been read out from the read-only optical disk by the reproducing apparatus are all written in the write once optical disk by the external storage device, thereby producing a pirate edition of the read-only optical disk.

In this case, if the read-only optical-disk is a CD-ROM where computer data (including computer program) are recorded, then a pirate edition of game software can be easily produced. If the read-only optical disk is a compact disc (CD) where music information are recorded, then it becomes possible to easily produce a pirate edition of the compact disc. Since computer programs are copyrighted material protected by copyright, copies—except those made by the regular user, i.e., registered users who accepted the software license agreement (software license agreement)—for backup or copies for the hard disk are illegal.

Further, copy for thoroughly copying recorded data on the CD-ROM which is a copyright material to the write once optical disk for the purpose of action of concession in distribution is also illegal and such illegal action for obtaining unfair profit should be prevented.

Furthermore, an act wherein a regular user makes a free distribution for those who are not regular users in an enterprise or CAI (Computer Assisted Instruction) is regarded as serious.

At present, there are a variety of proposed methods for copy protection many of which have been reduced to practice. On the other hand, a software (program or the like) called "copy tool" used in removing copy protection is now commercially available. Short of the user's own conscience, there is currently no other way to prevent the illegal copying of recorded data.

In view of the aforesaid, it is an object of the present invention to provide a data recording method wherein an illegal copy between disk-like recording mediums can be effectively protected even against a copy tool and in which copyrighted material (recorded data) recorded on the disk-like recording medium can be protected.

Interactive productions allow a user of a computer system to interact with movies, video or other displayed images while the images are being updated at a rapid rate. The purpose of these productions is to present useful information, educate or entertain the user. The ultimate goal of interactive technology is to make the user feel as though they are interacting with images on the screen so that, for example, characters or objects in a drama react to the users actions. The user's actions can affect characters, objects or other images on the display screen and change the course of the storyline.

One method for providing a high degree of interaction is to make the production completely computer generated. This means that the computer models a three dimensional world and calculates and displays the orientation of figures and objects on the screen. However, this approach is limited by today's technology because the computing power to fully calculate and render lifelike images, especially human figures, at resolutions approaching television quality in real time at video or film refresh rates is beyond the current technology for mass-marketed systems.

A different approach is to prerecord video, film or computer generated image sequences and play the prerecorded

images, or frames, back at high speed. This achieves the resolution of television, or better, and is sufficiently lifelike to create a level of believability comparable to television. However, in this approach the user has a very limited amount of interactivity with the production since the user's ability to affect the story is limited to the small number of different "paths" of prerecorded image sequences that are branched to at predetermined decision points in the video or animation sequence. The use of any prerecorded sequences of images that are played back so as to achieve animation while allowing a user to interact with the images is referred to broadly here as "interactive video."

Interactive video productions typically use a compact disc read-only memory (CD-ROM) disc to store the images and a CD-ROM drive to retrieve images during playback. The CD-ROM disc stores information in a concentric spiral on optical media and is "read" or played back with a CD-ROM drive that uses a "read head" with a laser beam. The big problem with CD-ROM based interactive production is the break in continuity due to delays of about a half-second or more required to locate a desired branch path that is different from the current path that the drive's read head is tracking. Another problem is that CD-ROM based interactive video productions are severely limited in the number and types of ways that a user may interact with the video.

The length of time to access a different video path ("access time" or "seek time") depends upon the location of the different video path with respect to the current placement of the CD-ROM drive's read head. In order to access a given video sequence, a computer controller looks up the location of the sequence in an index and instructs the CD-ROM drive to access the new sequence by moving the read head to the beginning of the new sequence on the disc. Since the read head is moved by a mechanical mechanism it takes a comparatively long time to reposition the read head to a new point on the track to access the different video path.

The prior art uses caches to try to improve the performance of accessing data in a CD-ROM. The cache can be in the CD-ROM drive, in an interface card between the processor and the drive, in the memory of the computer system controlled by software or even on a hard disk or other storage medium. However, these caches only provide marginal improvement in access times where video is concerned because of the relatively small sizes of the caches compared to the data rate of the information coming off of the CD-ROM. Also, when a different path is branched to the information in the caches is usually useless since they don't contain the new data. The caches must be "purged" and loaded with new information.

While current CD-ROM drives are not adequate to provide sufficient interactivity in interactive video productions, they represent a huge installed base since hundreds of thousands have already been sold to consumers. Therefore, a system which eliminates the access time in CD-ROM based interactive videos without requiring modification of existing CD-ROM drives is desired.

Conventionally, a so-called LD (Laser Disk) and a so-called CD (Compact Disk) are generalized as optical disks, on which information such as video information, audio information and the like is recorded. On the LD or the like, the video information and the audio information are recorded together with time information indicating a time at which each information is to be reproduced with respect to a reproduction start position, which each LD or the like has, as a standard position. Thus, other than a general normal reproduction to reproduce the recorded information in the

order of recording, various special reproductions are possible, such as a reproduction to extract and listen to an only desirable music out of a plurality of recorded musics, a reproduction to listen to the recorded musics in a random order and so on, in case of the CD, for example.

However, there is a problem that, according to the above mentioned LD or the like, a so-called interactive and variegated reproduction is not possible in which the audience can have a plurality of selection branches as for the video or audio information to be displayed or sound-outputted and in which the audience can select them to watch or listen to it. Namely, for example, in case of giving audience to a foreign movie on the LD, it is not possible to select one of languages to be used for a subtitle (caption) displayed on the picture plane (e.g., select one of the subtitle in Japanese and the subtitle in the original language) so as to display the subtitle in the selected language, or, in case of giving audience to a music recorded on the CD, it is not possible to select one of sound voices of the music (e.g., select one of the English lyric and the Japanese lyric).

On the other hand, various proposals and developments are being made as for the DVD, as an optical disk in which the memory capacity is improved by about ten times without changing the size of the optical disk itself as compared with the aforementioned conventional CD. With respect to this DVD, if a plurality of subtitles in various languages or a plurality of voice sounds in various languages are recorded, the above mentioned interactive and variegated reproduction is possible as the audience selects one of them.

However, the information amount of the audio information or music information becomes enormous if the audio or voice sounds in various languages or the music in various types are recorded on the above mentioned DVD. At this time, if the information is not recorded in an appropriate recording form, the process for searching the audio information etc. to be reproduced becomes complicated, and a case where the audio sound or music sound etc. is interrupted in the middle of the reproduction due to the time required to search the audio information etc. may happen at the time of reproduction, which is a problem.

While various embodiments have been described above, it should be understood that they have been presented by way of example only, and not limitation. Thus, the breadth and scope of a preferred embodiment should not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with the following claims and their equivalents.

What is claimed is:

1. A method for permitting selective access to multimedia data on a standalone electronic storage medium comprising the steps of:

- (a) reading an identifier stored on the electronic storage medium by software on a device after inserting the electronic storage medium into the device wherein the identifier identifies a specific instance of the electronic storage medium;
- (b) transferring the identifier to a location of a separate database by software on the device;
- (c) verifying at the separate database that a matching identifier already exists in the separate database; and
- (d) precluding access to the data upon unsuccessful verification of the identifier.

2. The method for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 1 further comprising effecting a remote link between the device and the separate database to verify that a matching identifier already exists in the separate database.

3. The method for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 1, wherein the verification includes combining identifier information associated with the identifier and user information associated with the user and looking up both the identifier information and the user information on the separate database.

4. The method for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 1 further comprising storing for future reference a record of the steps of the method on the separate database.

5. The method for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 1, wherein the computer is remotely coupled to the separate database via a network.

6. The method for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 5, wherein the network is the Internet.

7. The method for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 5, wherein the data is embodied on a website.

8. The method for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 1, wherein the electronic storage medium is an optical disc.

9. The method for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 8, wherein the identifier is stored on a burst cut area of the optical disc.

10. The method for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 1, wherein the data is stored in a remote database.

11. A computer readable medium embodying a computer program for permitting selective access to data stored on a standalone electronic storage medium wherein the computer program comprises:

- (a) a code segment for reading an identifier stored on the electronic storage medium after inserting the electronic storage medium into the computer wherein the identifier identifies a specific instance of the electronic storage medium;
- (b) a code segment for transferring the identifier to a location of a separate database;
- (c) a code segment for verifying at the separate database that a matching identifier already exists in the separate database; and
- (d) a code segment for precluding access to data in the electronic storage medium upon unsuccessful verification of the identifier.

12. The computer readable medium embodying a computer program for permitting selective access to data based on an identifier stored on an electronic storage medium as



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recited in claim 11 further comprising a code segment for effecting a remote link between the device and the separate database to verify that a matching identifier already exists in the separate database.

13. The computer program for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 11, wherein the verification includes combining identifier information associated with the identifier and user information associated with the user and looking up both the identifier information and the user information on the separate database.

14. The computer readable medium embodying a computer program for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 11 further comprising a code segment for storing for future reference a record of the steps of the method on the separate database.

15. The computer program for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 11, wherein the computer is remotely coupled to the separate database via a network.

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16. The computer program for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 15, wherein the network utilizes an internet protocol.

17. The computer program for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 15, wherein the data is embodied on a website.

18. The computer program for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 11, wherein the electronic storage medium is an optical disc.

19. The computer program for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 18, wherein the identifier is stored on a burst cut area of the optical disc.

20. The computer program for permitting selective access to data based on an identifier stored on an electronic storage medium as recited in claim 11, wherein the data is stored in a remote database.

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